BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 22 1946

SOME ASPECTS OF CHEMISTRY RELATED TO MEDICINE*

BY

Sir ROBERT ROBINSON, D.Sc., P.R.S.

It is a great privilege to be the first to have the opportunity to congratulate the Board and all those who labour within these walls on the Bicentenary of the Middlesex Hospital. The Foundation took place shortly after the death of Boerhaave, of Leyden, the greatest of eighteenth-century teachers, and also near the date of the birth of Lavoisier. Thus the entire development of scientific medicine and modern chemistry occurred during the period now celebrated. I speak to you as a chemist, and my acquaintance with medicine is superficial—rather like a Nature-lover's knowledge of scientific botany and zoology. As a concession to my diffidence I trust I may be allowed to alter the title of my address from "Chemistry and Medicine" to "Some Aspects of Chemistry Related to Medicine."

There are few human activities that have no relation to medicine, and it is equally true that all branches of medicine are already connected, or are destined to be connected, with chemistry. It would be preaching to the converted to develop that theme as propaganda, because the clock will not be set back, and the fundamental nature, for medicine, of the science of the transformation of matter is already fully recognized. Chemistry is of service to medicine in very many directions, of which I will mention only the more important. There are the alloys, plastics, and other materials used to improve the technique of medical and surgical practice. Many of these are incidental to more general developments, but others have involved specific research. In the field of preventive medicine the purification of water, for example by chlorination, should not be overlooked as an application of chemistry, whilst the production of new insecticides and insect repellants is making an increasingly important contribution to hygiene. The huge subject of nutrition, involving vitamins, essential amino-acids, minor elements, and the balance of diet, is obviously a meeting-ground of chemists and physiologists.

Then, more directly, we have the general and local anaesthetics, the analgesics and hypnotics; also the substances which promote or inhibit various bodily functions—an omnibus definition which could embrace the natural and synthetic hormones, insulin and the liver factors, thiouracil, etc., and also groups such as the laxatives, diuretics, and so on. There is no danger of forgetting the chemotherapeutic agents, which we may class together irrespective of the mechanism of their action. Finally, we have the subject of toxicology, the use of chemical analysis and biochemical control in diagnosis, the blood groups, and immunology.

That list is by no means complete, and I shall make no attempt to cope with it.

As an organic chemist I propose to make some general remarks and to mention a few special themes, chosen because I happen to have been interested in them, and certainly not because of their intrinsic significance in the general picture. And first I want to emphasize that organic chemistry must still be developed for its own sake; it is very imperfect, and not yet a reliable handmaiden for other sciences. It is perfectly true that great success has attended the isolation of substances of physiological importance and that many of these have been ingeniously synthesized. As a result many medical scientists have come to the conclusion that our technique is adequate for almost any task. But the truth is that we can quickly cover only such ground as the advance of knowledge makes accessible.

Our position is similar to that of the metaphysicians, who always manage to catch up to the wave of scientific progress, but never take a step in front of it. Or, to take a closer analogy, chemistry is to medicine as mathematics is to physics. The physicist, however, has usually enough mathematical equipment to make it possible for him to appreciate the limitations of the power of mathematicians to solve his problems. He knows that an increase of these powers will inevitably raise his own potential, and he therefore encourages the pure mathematician even in work that seems devoid of any possible application.

In the case of organic chemistry applied to biological research it is easy to see the direct results of relatively recent improvements in laboratory methods such as micro-analysis, chromatography, molecular distillation, use of tracer elements, *x*-ray analysis of crystals, and ultra-violet and infra-red spectrography. It is well understood that this and that advance in physiology, or other medical science, would have been impossible without these facilities, or at least would have been greatly delayed. But what is perhaps not so widely appreciated is the debt owed to pioneers of structural and synthetic chemistry, to the discoverers of general reactions, and to those who have disclosed the mechanism of reactions and the relations between properties and molecular constitution.

The system of organic chemistry is a wonderful achievement, but the noble edifice that has been reared is still unfinished. The reason for stressing the point is that there may be some danger of too great a diversion of scientific man-power into *ad hoc* work, even if that consists of the wholly admirable studies of biological problems. It is perfectly true that some of these will be found beyond our present capacity to solve and that such research will disclose the existence of gaps in knowledge and may lead to the exploration of a rich territory.

In the past the study of natural products has indeed afforded that kind of stimulus. Outstanding examples are the carbohydrates, the terpenes, the alkaloids, the steroids, and the vegetable and animal colouring matters. These substances were easily accessible in quantity, and they were examined mainly for their purely chemical interest. If I may be pardoned a personal reference, I have been asked why I am still interested in the study of strychnine. Except as a tonic and vermin-killer it is of no particular use, and its biological significance as a waste product of the economy of the plant is not apparent. The answer is that we are interested in the behaviour of a unique molecule which contains no fewer than seven interlocked rings, and that we have faith that the investigation will add stones to that edifice I have already mentioned, on which others will later be placed. And whether that is so or not, the challenges of Nature have to be accepted. It is not for us to presume to assess the importance of new knowledge to future generations.

When Wieland and Windaus attacked the steroids it was from this point of view alone, though we must admit that the steroid hormones were a kind of bonus not likely to be often bestowed in such generous measure.

* Address at Bicentenary Celebrations of the Middlesex Hospital, May 20, 1946.

Penicillin Synthesis

The chemistry of penicillin gives a good example of quick success in one direction by the use of established methods and of failure in another, due to the fact that a certain field of synthesis has not yet been cultivated. After the preparation of penicillin concentrates, it was a matter of routine to find the conditions of stability of the antibiotic and, though it proved a difficult task, to obtain the pure crystalline sodium salt.

The determination of molecular structure was also far from easy, but it followed normal lines of procedure. A final doubtful point was cleared up by *x*-ray analysis of the crystals. The substance is relatively simple. Everything seemed plain sailing for the synthesis, and yet very strong American and British teams have been unable to achieve it in a practicable manner. It is very probable that penicillin has actually been synthesized, but the yield is only about 0.1% of the theoretical, and the method has therefore no practical importance as it stands. The explanation is that we are faced with a new kind of difficulty presented by the great instability of the molecule, combined with a lack of methods suited for the construction of the characteristic β-lactam unit, under the conditions imposed by the properties of the substance. All the known methods are too brutal for that delicate system. So we have to find some new method, and that sequence of operations is not what we had hoped for, and has indeed seldom been necessary for the synthesis of natural products of comparable complexity. Somewhat analogous were the syntheses of indigo by Baeyer, Heumann, and Sandmeyer, because there was no precedent for the reactions that were eventually discovered after many years of intensive work. Ziegler's device for overcoming the reluctance with which large rings are formed was entirely novel, and something similar to it may well apply to the case of penicillin.

Our medical friends, who have seen a whole series of vitamins and hormones synthesized very soon after their characterization and structural analysis, are keenly disappointed in us. Dr. Vannevar Bush remarked, "They tell me that it is only a question of removing a molecule of water." Alas, that is all it is!

While on this topic I will add that though total chemical synthesis, or rather synthetical manufacture, is not in sight, biosynthesis, by appropriate feeding of the mould, has given us new penicillins. Moreover, one of the penicillins has been chemically modified, with the production of substances of increased activity. Thus we already have a range of penicillins which, as in the case of the sulphonamides, will doubtless be differentiated in regard to their suitability for the treatment of infections. It follows that one of the advantages anticipated from chemical synthesis has been partly secured in a different way. I do not want you to conclude that the prognosis for synthesis is unfavourable. On the contrary, the problem is well defined, and will be solved—when we have had time to learn some more organic chemistry.

A Gap in our Knowledge: Proteins

The most obvious gap in our exact knowledge of substances of biological importance is in relation to the proteins. Their molecular complexity, and variety in complexity, continue to defeat us, but, nevertheless, great progress has been made and the outlook is promising. At Harvard University Medical School, Prof. Cohn and his colleagues have built up a most impressive laboratory, devoted to the application of physico-chemical principles and methods to the separation and study of proteins. There is room in this country for a similar "Institute of Protein Chemistry." There is no more important subject, and none that offers greater rewards to the investigator.

It is a matter for congratulation that Prof. A. C. Chibnall has brought his great experimental skill and critical faculty to bear on the analysis of proteins and the interpretation of the results; similarly, that Prof. A. R. Todd is so well on the way to the synthesis of sections of the nucleo-protein molecule and, incidentally, of the coenzymes. It is also good to know that the urgency of the work is recognized here and that Prof. E. C. Dodds has embarked on a study of physiologically active proteins. By contrast with these I am reminded of the useful "dead" proteins—wool, silk, leather, and even pea-nut protein. Much valuable work has already been carried out by the respective research associations—for example, Dr. Jordan Lloyd's leather team—and all that will come into the mill.

The indications are that the probing of the protein molecule will before long reveal the mode of organization of the units, but that is only the first step to a real understanding of their role in Nature. We are almost compelled to believe that the nucleo-proteins are keeping one of the secrets of life itself, and it is hard to resist speculations that connect the four great and peculiar branches of their molecules with a mechanism of biosynthesis of particular importance. To regard them as a kind of template, on which other molecules are moulded, is doubtless a crude conception, but the proliferation of viruses shows that in a suitable environment macro-proteins can reproduce themselves.

We know that the viruses and bacteriophages cannot be generalized and that they vary greatly in size, by a factor of at least 1,000, and in organization. It must also be admitted that the host may make an essential contribution to the reproductive process—for example, by the provision of raw material such as amino-acids. Nevertheless reproduction does occur, and some day we shall know how. That knowledge will be of the greatest consequence to the human race, and all the resources of physical and biological science should be brought to bear on the quest. The discovery of the intimate mechanisms of biosynthesis of proteins would clearly have repercussions in fields such as heredity and ageing, and it might show the way to the conquest of cancer and the viruses.

The study of living things necessarily starts with the family, then proceeds to the individual organism, then to its parts—morphology before physiology; it is a development from the outside inward. The physical sciences often adopt the same method; but the system of organic chemistry, like mathematics, proceeds from the simple to the more complex. It seems that the biologist and the chemist, using these different methods of approach, are nearing one another at the level of the proteins and viruses. Godspeed to their meeting.

I would now like to refer to a few matters of detail. As I have already said, the selection I have made is somewhat arbitrary and reflects my own recent interests.

Configuration of Antibiotics

The hydrolysis of penicillin—of all the penicillins so far as is known—affords a bis-homologue of cysteine called penicillamine. This is not the dimethyl derivative of natural *l*-cysteine, but of the optical antipode, *d*-cysteine. The configurations of the amino-acid units of proteins are related; they are all male screws or perhaps all female; we can't tell which. Thus penicillamine belongs to the "unnatural" family of amino-acids. Similarly gliotoxin is degraded to unnatural *d*-alanine, and the peptide group of antibiotics such as gramicidin seem also to be built up largely from unnatural amino-acids. It has just been reported that streptomycin can be degraded to *l*-glucosamine, whereas the natural glucosamine is the *d* form. These coincidences are significant.

Dr. J. W. Cornforth has suggested that the common factor may well be that the antibiotics are protected from destruction in the body by their antipodal configuration. This seems a reasonable view, and it leads to the conclusion that whereas optical activity is certainly not always an essential feature of a chemotherapeutic agent, yet, when the possibility exists, the *d* and *l* forms should always be tested separately.

Gause states that the *d*- and *l*-mepacrines are equally effective against malaria, but that the *d* variety is only half as toxic as the *l* variety. Hammick and Chambers, using the racemic compound, found that the *d* form is metabolized in the body and that the drug excreted in human urine consists entirely of the *l* isomer. The collation of these results does not spring to the eye, but, as in other matters, anything is more welcome than indifference.

Toxic Fatty Acids

Dr. N. Polgar has been studying the fatty acids of tubercle bacilli, first examined by Anderson. They are of interest because of their toxicity and power to produce lesions in experimental animals. The saturated phthioic acid, $C_{26}H_{52}O_2$, is typical of a whole range of these constituents that can be isolated from the bacillary bodies. The available evidence

indicates that it is 3:13:19-trimethyltricosanoic acid—that is, it is a straight-chain C_{23} acid with three methyl notches. A synthetical acid of this structure which has been obtained is probably a stereo-isomeride of phthioic acid. This, and a related unsaturated acid, are markedly toxic, and examination of near relatives shows that the property is highly constitutive. Polgar suggests that the methyl groups may facilitate dehydrogenation in their vicinity and that the products may antagonize some essential unsaturated fatty acid. It is too early to discuss this tentative hypothesis, but we no longer regard this investigation from the point of view of a direct attack on the bacilli. The objective is now to find a means of alleviating the symptoms of the disease and thus perhaps to give it a more favourable course.

Action of Carcinogenic Agents

The mechanism of the action of carcinogenic agents and the relation of carcinogenicity to constitution have been the subject of much research and discussion, but no generalization has emerged. This is certainly partly due to the fact that the biological experimentation has not been standardized and to the doubtful nature of many of the findings. Dr. I. Berenblum and I have surveyed the results and think that the weight of evidence indicates the possibility of reaction at an activated phenanthrene-type bridge in the great majority of cases; but there are apparent exceptions, and more than one mechanism may be involved. We do not intend to advance even a provisional hypothesis until more experimental evidence has been garnered.

One method of attack is to test substances derived from known carcinogens by replacement of a benzene ring by the isosteric thiophene nucleus. It has been found that such substances may be powerful carcinogens. In the case of 9:10-dimethyl-1:2-benzanthracene there are three benzene nuclei that might be so replaced. In two of the cases, that has been already carried out by Fieser, and the products are reported to be carcinogenic. B. Tilak has now made the third isomeride at Oxford. In this the phenanthrene bridge is replaced by sulphur, and the substance is not carcinogenic by subcutaneous injection. It is weakly carcinogenic in the painting technique, but the tumours show a tendency to regress. Many other examples must be studied, and the observations of Dodds, Lawson, and Williams that α-ethyl-β-sec-butylstilbene is carcinogenic can be brought into line with the phenanthrene-bridge idea only by assuming dehydrogenation of the agent *in vivo*.

There are many tantalizing indications of the possibility of a chemotherapy of cancer which is, however, never likely to prove so simple a process as the control of an infection by a sulphonamide or penicillin.

A considerable number of substances have been observed by Haddow and others to cause retrogression of tumours in experimental animals, but, so far as I am aware, none has found practical application. A different approach is mentioned by Prof. Gye in his recent report of the Imperial Cancer Research Fund. A delay in the appearance of mammary cancer in mice can be brought about by thiourea, which blocks thyroid activity and so lowers the basal metabolic rate.

That is, by way of digression, another fascinating story of the interaction of chemistry and medicine. It includes Harington's work on thyroxine, culminating in its synthesis, and the demonstration of its biosynthesis from the tyrosine bound in proteins; as well as the use of thiourea, then thiouracil or its alkyl derivatives, in cases of Graves's disease.

But the most dramatic indication that certain types of carcinoma may be amenable to chemical treatment arises directly from the work of Prof. E. C. Dodds, here at the Middlesex Hospital. It would certainly be carrying coals to Newcastle to describe the stages by which Dodds and his collaborators were led to the striking discovery of potent synthetic oestrogens, or to dilate on the proved value of these substances in medical and veterinary practice. I will only remark that as far back as 1933 Cook and Dodds noted that certain carcinogens exhibited oestrogenic properties, and the oestrogen–androgen relationships with various forms of cancer are now widely recognized and discussed. Arising from this, several American groups, and especially Huggins, were led to try stilboestrol, either as a substitute for or in conjunction with orchidectomy, in cases of cancer of the prostate. The early results were highly encouraging, but later experience suggests caution.

Inquiries which I made when in America in August of 1945 elicited that about 80% of the patients experienced marked improvement with retrogression of the tumours and repair in many cases. However, the tumours reappeared at various intervals in the majority of the cases, but some 20% remained cured after two years. If that is a fair statement and my arithmetic is correct, it means that at least two men in every hundred over 50 years of age will have reason to be grateful for the discovery of stilboestrol.

Modern Chemotherapy

At the present time the development of chemotherapy is no longer a question of the blind preparation of a series of related compounds to be tested and reported on as good, bad, or indifferent. That system went far to justify the remark of a physiologist at a committee of which I was chairman, that he "thought they had now devised an excellent system for turning down the substances produced by the chemists." Thanks to the discoveries of Woods and Fildes and others, we try to find some rational basis for chemotherapy and, be it right or wrong, a working hypothesis is invaluable. For example, the discovery of paludrine by Curd and Rose followed stages suggested by analogies in constitution to known active substances, as well as by a hypothesis of the mode of action of antimalarials. I commend their paper to your attention as an outstanding example of intelligently guided approach in this type of research. Incidentally, this is an opportunity to recognize with gratitude our debt to workers in the laboratories associated with chemical industry. Bayer 205, neosalvarsan, pamaquin, mepacrine, paludrine, prontosil, and sulphapyridine are a few examples of a long list of valuable agents which we owe to industry. Another modern development is the attention which is paid to the ease of absorption of the agents, their distribution in the body, the metabolic changes they undergo, and the side-effects they produce.

Hence successful medico-chemical research depends on effective co-operation, and this is most easily achieved when those trained in the different disciplines work under one roof.

For practical reasons, such as the dangers of amateur bacteriology and the upkeep of animal-houses, the chemist is normally the migratory component. But it is not enough to ensure that every medical research institute is equipped with a staff of chemists. The biologist is the first to encounter the problems, and even when they are clearly of a chemical nature, there is often a serious lag before the appropriate chemist can make his contribution. In this respect we have compared rather unfavourably with some other countries.

Conclusion

Finally, I think that steps should be taken to improve the teaching of chemistry to medical students by drastic revision of the syllabus and by better laboratory facilities. In this way we may quicken the interest of medical men in general in developments which are sure to assume greater and greater importance. I venture to think, too, that a quicker route to medical scientific research should be open to a limited number of promising students, without the loss of the prestige of a medical qualification. That, I know, is a very thorny problem, and its solution would involve some break with tradition.

In some quarters faith in the eventual full success of the applications of chemistry to medicine is regarded as evidence of a materialistic outlook, and the defects of chemotherapy, as at present practised, are eagerly emphasized. Interference with physiological functions and the encouragement of resistant strains doubtless exist, but who can deny that mercury, salvarsan, sulphanilamide, sulphadiazine, and penicillin are milestones in a march of progress and that, without making extravagant claims to comprehend the whole field of medicine, the biologist and the chemist, hand in hand, can still do much more to alleviate the sufferings of humanity?

The Bureau of Current Affairs, 117, Piccadilly, London, W.1, has now produced the first numbers of its fortnightly publication, *Current Affairs*, which is available to civilian subscribers at 8s. 6d. per annum as well as to the Services; No. 3 comprises an article by Ritchie Calder entitled "Health of a Nation."

LUMBO-SACRAL ROOT PAIN

BY

J. MacD. HOLMES, M.D., M.R.C.P.

Physician, Staffordshire General Infirmary; Consultant Physician, Wrexham and East Denbighshire War Memorial Hospital

AND

B. R. SWORN, M.B., F.R.C.S.

Surgeon, Staffordshire General Infirmary

It is now possible in most cases of "sciatica" to make a reasonably accurate diagnosis of the lesion responsible for the pain. A turning-point was the paper of Mixter and Barr (1934), reporting a series of cases in which protrusion of the intervertebral disks had caused pressure on the lumbar nerve roots and describing the diagnosis of disk protrusion by means of myelography. The occurrence of disk protrusion had been reported previously, but had not been regarded as sufficiently important or frequent to have much bearing on such a common condition as "sciatica."

Primary or idiopathic sciatica was for a long time accepted as a distinct clinical entity, and it was perhaps natural that clinicians should expect to find a common pathological basis in the majority of cases. Thus Dejerine thought that sciatic neuralgia was due to an inflammation of the lumbo-sacral nerve roots, which he called "radiculitis," and Sicard and Forestier suggested the term "funiculitis" for an inflammation of that part of the nerve traversing the intervertebral canal between the root and the plexus. With the increase in the use of *x* rays, the frequent occurrence of abnormalities of the lower lumbar vertebrae was noticed. Goldthwait of Boston postulated, more especially, the various degrees of sacralization of the fifth lumbar vertebra as the commonest cause of sciatica. Later Putti regarded arthritis of the intervertebral joints as the most common cause. Others have considered the condition to be a manifestation of myofascial "rheumatism" or "fibrositis." Since the recognition of the importance of disk prolapse it has been said that, except for an occasional cauda equina tumour, all cases of primary sciatica are due to disk lesions (Dandy, 1943).

In spite of these opinions we think there are a variety of lesions and these affect different parts of the nerve. Within the spinal canal pressure on nerve roots is almost certainly the commonest cause of symptoms, while arthritis of the intervertebral joints may be the most frequent lesion affecting the nerve roots in their course through the intervertebral foramen. Fibrositis and allied myofascial conditions are probably responsible for involvement of the nerves after they have emerged from the vertebral column. There is little evidence that inflammation of the main trunk of the nerve is a cause of sciatica, and Symonds (1943) is probably correct in saying that the sight of an inflamed and swollen sciatic nerve "trunk" "has never yet been granted to human eyes."

There is a tendency for each of the three main levels of nerve involvement to show a different clinical picture, but nevertheless differential diagnosis is no easy matter. Lesions of the nerve beyond the vertebral column are associated with chronic lumbar pain, and pain along the course of the sciatic nerve is seldom severe or early. The finding of "trigger points" of tenderness in the lumbar muscles is frequent in myofascial lesions, and is of considerable diagnostic significance. Lumbar pain alone also occurs for long periods before the onset of sciatica in arthritis of the intervertebral joints. The sciatic pain in this condition is not usually severe, and is often brought on by exercise and readily relieved by rest. On the other hand, muscle-wasting in the leg may be marked, and loss of power in dorsiflexion of the ankle, and even foot-drop, are seen more often than in either of the other types, with the exception of tumours of the cauda equina.

Where there is involvement of the nerve roots within the spinal canal lumbar pain may also be the first symptom; but this is not usual, and the sciatic pain soon becomes the dominant symptom. More often the sciatica is present from the onset, and may be very severe. In nearly every case there is exacerbation of the pain on coughing, sneezing, or other similar strain; this we regard as the most important single symptom pointing to a lesion involving the root within the spinal canal. Paraesthesiae in the dermatome supplied by the affected root are of great diagnostic value, but it is well known that all the symptoms may be intermittent, particularly in cases of disk prolapse. The neurological signs are also intermittent and variable. Their diagnostic value will be discussed later.

Classification of a Series of 50 Cases

Most of our present series of cases are those we considered to have some condition affecting a lower lumbar or first sacral nerve root within the spinal canal. We have included a few cases in which we decided to operate because of intractable or recurrent pain, although they did not fulfil all our diagnostic criteria. It is not surprising that our results in this latter group are unsatisfactory, but we were interested to find, on reviewing the cases, that, in all in which we had made a confident diagnosis of a lesion affecting the posterior roots, at least a considerable measure of relief followed operation—in spite of the fact that in some of them we had found no visible lesion.

TABLE I.—*Types of Lesion found at Operation (50 cases)*

	Cases
1. Ruptured intervertebral disks	27
2. Tumours of the cauda equina	3
3. Hypertrophy of ligamentum flavum following lumbar puncture	2
4. Ruptured ligamentum flavum	1
5. "Radiculitis"	5
6. Transverse defect in myelograms. "Disk projection"	2
7. No lesion found:	
With signs of root lesion	6
Without signs of root lesion	4

This classification of our cases is based upon the findings at operation, although we are well aware that a surgeon's findings may not be completely reliable, since he is likely to find only lesions which are obvious or with which he is familiar.

Of our cases 54% were *lesions of the disk*, comprising three main types. The commonest is one in which a portion of fibrocartilage is avulsed from the posterior margin of the disk and is often lying free in the spinal canal. It may, however, be in front of the posterior common ligament—if that is intact—and be found only after incising the ligament, although its presence is often obvious from the backward displacement of the latter. In other cases the disk appears to have undergone degeneration, forming a softened material which extrudes through an incision into the posterior common ligament. Extrusion of the nucleus pulposus is the third type, and this may be difficult to distinguish from the previous one because the extruded material is soft and gelatinous. Characteristically this follows injuries to the disk by lumbar puncture.

Hypertrophy of the ligamentum flavum was found in two of our cases, although it has been denied by Dandy (1943) that it is ever the cause of root pain. In both our patients the hypertrophy followed trauma by a lumbar-puncture needle. In the first, a young woman, lumbar puncture had been carried out for spinal analgesia; and in the second, a young man, 18 lumbar punctures had been done 10 years before for the treatment of cerebrospinal meningitis. Symptoms—mainly of low backache, but with some occasional posterior crural pain—had come on gradually until he was almost crippled. Lumbar puncture in the fourth space gave a "dry tap." Injection of iodized oil higher up, and myelography, showed a complete block at the level of the lower border of the third lumbar vertebra. The diagnosis of thickening of the ligamentum flavum was confirmed at operation, when the ligament was seen to be enormously thickened, forming an "hour-glass" constriction of the theca. Excision of the thickened ligament was followed by filling of the lower theca with cerebrospinal fluid. Subsequently his pain slowly subsided.

There were five cases of what we have called "*radiculitis*." We have previously reported three of these under the title "sciatic neuritis" (Holmes and Sworn, 1945). The lesions found were of two types. There were three cases with gross swelling of the affected root but without any discoverable mechanical cause. It is true that oedema and swelling of the root may be associated with a ruptured disk, but we have never seen them to anything like the same degree. In one of our patients—following the suggestion of Burns and Young (1945) that in the lower lumbar region a nerve root may be affected by the disk above—we explored the fourth lumbar disk imme-

diately above. No lesion was found; but the contrast between the normal and the enlarged roots was considerable. In two patients the root was normal in size, but there were adhesions between it and surrounding structures, particularly anteriorly, and nothing else abnormal was found. It seems possible that these two cases may represent a later stage of the first type. The pathology in this group of five cases is obscure. The gross oedema and adhesions suggest inflammation; but against this are the history of trauma in all but one case and no changes in the cerebrospinal fluid suggestive of inflammation.

The occurrence of almost complete *transverse filling defects in the myelogram*, with no lesion discovered at operation, has previously been noted. Hyndman, Steindler, and Wolkin (1943) regard these as false defects, but say that "the results [of operation] have been as favourable as when a herniated disk has been found and removed." They also remark that from such cases "one might deduce that causes other than herniated disk may be responsible for root pain at the fourth and fifth lumbar vertebrae." We have had two such cases, both relieved by operation, one of which seems worth describing in detail.

A woman aged 50 was referred to us by Mr. D. Wainwright from the Orthopaedic Hospital, Stoke-on-Trent. She had suffered from low back pain for 25 years and intermittent left sciatica for the past five years. There was severe left-sided sciatic pain on coughing and sneezing. She had occasional "pins and needles" sensations on the outer border of the left foot. On examination Lasègue's sign was positive on the left side at 45°. There was no motor weakness or muscle-wasting. Slight impairment of sensation to pin-prick and light touch was present on the outer border of the left foot and external malleolus. The ankle- and knee-jerks were present and equal. Lumbar puncture revealed no subarachnoid block and a normal fluid with a protein content of 40 mg. per 100 ml. W.R. negative. Straight skiagrams of the lumbar spine showed no abnormality, but myelograms at intervals of two days revealed a constant transverse filling defect opposite the disk between L 4 and 5. At operation the fourth and fifth lumbar laminae were removed. The fourth and fifth disks appeared normal and no definite protrusion could be seen or felt. The nerve roots also appeared normal. There was some relief from pain immediately after the operation, and then gradual improvement until three months later, when the patient said she was completely free from pain.

We believe that this type of case is due to "*disk projection.*" Normally the disk projects a little further into the spinal canal than the vertebral body, and a slight exaggeration of this, especially in association with a rather short nerve root, might well account for the symptoms and also for the myelogram. Occasionally a similar myelogram is found with a wide herniation of a disk, and, although the filling defect is seldom so symmetrical, it may only be at operation that the two can be differentiated with certainty. We found no softening of the disks in these two cases. The important feature is that operation gives good results; though whether this is due to displacement of the root or to decompression is not clear.

Though in six cases with definite signs and symptoms of root irritation we found no lesion at operation, we are inclined to think that some lesion must have been present but overlooked. Two cases had what we thought was some thickening of the ligamentum flavum, but this may have been within normal limits.

Diagnosis

We are in agreement with Munro (1945), who sums up one of his articles by saying: "Clinical examinations lay the groundwork for suspecting the presence of a posterior herniation of a lumbar disk. Contrast myelography proves or disproves this suspicion, determines the level of the herniation, and leads to a minimal amount of surgery, should this be indicated." We might add to this that myelography is the only satisfactory procedure, except operation, for revealing the various causes of root compression. The need for it will of course depend upon the relative frequency of disk rupture and other lesions, but since we have a high proportion of the latter in our series we regard myelography as of the first importance. We have used it in every case in which operation has been seriously considered, and we do not think that it has affected any of our patients adversely. In most cases the iodized oil (neohydriol, fluid) has been removed by needling at the end of operation, and in some patients who did not come to operation we have removed the oil by the method of Kubik and Hampton (1941), although it is not always easy to obtain complete removal.

Table II gives the frequency of the clinical signs and symptoms in our series of 50 cases and illustrates our finding that the signs and symptoms in cases of "sciatica" cannot be relied upon to determine the type or exact level of the lesion. Increase in pain in the back of the leg on coughing or sneezing is the most valuable symptom indicating that a nerve root is affected within the spinal canal, but is of course not conclusive. It is true that in many patients a diagnosis of disk protrusion may be made from the history and clinical signs alone. Definite neurological signs, such as sensory loss in the fifth lumbar or first sacral dermatome, loss of ankle-jerk, motor weakness, and muscular wasting, are extremely valuable when present, but are very variable in their incidence even in cases of long standing. We are of the opinion that much greater accuracy is obtained from myelography.

TABLE II.—*Clinical Data in Groups of Cases with Disk Protrusion, with Other Lesions, and with No Discoverable Lesion*

Clinical Data	Disk Protrusion	Other Intraspinal Lesions	No Lesion Found
Males	24 (89%)	10 (77%)	7 (70%)
Females	3 (11%)	3 (23%)	3 (30%)
History of injury or strain	14 (51%)	9 (69%)	5 (50%)
Posterior crural pain	27 (100%)	12 (92%)	8 (80%)
Sensory impairment in dermatome	15 (55%)	9 (69%)	3 (30%)
Absence or diminution of ankle-jerk	16 (59%)	5 (38%)	4 (40%)
Deep tenderness in back of thigh	3 (11%)	6 (46%)	5 (50%)
Spinal tenderness	4 (15%)	4 (31%)	7 (70%)
Lasègue's sign	26 (96%)	12 (92%)	9 (90%)
Unilateral	23 (85%)	5 (38%)	9 (90%)
Bilateral	3 (11%)	7 (53%)	—
Increase of posterior crural pain on coughing	26 (96%)	12 (92%)	6 (60%)
Scoliosis	8 (30%)	7 (53%)	3 (30%)
Muscular wasting in leg	8 (30%)	4 (31%)	1 (10%)
Spinal subarachnoid block	1 (4%)	4 (31%)	—
Positive myelogram	25 (92%)	12 (92%)	2 (20%)

Percentages are given to the nearest whole number.
Of the disk protrusions 20 were of the disk between L 5 and S 1; 6 were of the disk between L 4 and L 5; and in one case there were three protrusions—at L 3 to 4, L 4 to 5, and L 5 to S 1, with spinal subarachnoid block.

Results of Myelography

In the following summary a "positive" myelogram means that a filling defect was present in the iodized-oil column. The abnormalities of filling varied from small defects in the region of the "axillary pouches" of the nerve roots to large notched or transverse defects in the main column of oil.

1. *Disk Protrusions.*—Myelogram positive in 25 cases; doubtful in two cases.

2. *Tumours of the Cauda Equina.*—Myelogram positive in all three cases, but diagnosis had previously been made from the presence of subarachnoid block and increased protein content of the C.S.F. Myelograms defined the limits of the tumours.

3. *Hypertrophy of the Ligamentum Flavum following Lumbar Puncture.*—Myelogram positive in both cases. "Hour-glass" defects were present, with complete subarachnoid block in one case.

4. *Ruptured Ligamentum Flavum.*—A small notched defect was seen in the one case.

5. "*Radiculitis.*"—Positive in four cases, negative in one.

6. "*Disk Protrusion.*"—Transverse defects in both cases.

7. *No Lesion Found.*—(*a*) In the two cases of doubtful thickening of the ligamentum flavum one myelogram was positive. (*b*) In the other four cases with signs of root irritation one was positive, two doubtful, and one unsatisfactory owing to the patient being in severe pain and unable to be manipulated. (*c*) The four cases without signs of root irritation all had negative myelograms.

Treatment

There is no doubt that most cases of "sciatica" will clear up spontaneously, or can be cured or relieved by relatively simple measures without resort to surgery. Rest in bed, splinting, physiotherapy (particularly the application of heat), injection of "trigger points" with local analgesic, and epidural injections of saline or local analgesic, all give successful results. There is also no doubt that a small number of cases are unaffected by such measures or suffer from recurrence of pain at intervals. It is not always satisfactory to temporize and attempt simple treatment in every case. The condition may be progressive, as in spinal tumour. Even in cases of disk protrusion a sudden increase in the protrusion may sometimes cause an irrecoverable paraplegia. It is, moreover, important to most patients that

they should return to work and be free from disability as quickly as possible.

We have therefore made a complete clinical and radiological examination of all our patients with sciatica, including lumbar puncture with manometry and examination of the cerebrospinal fluid. If the presence of root irritation has been suggested, or if pain has been severe or of long duration, we have discussed the possibility of operation. If operation has seemed necessary, and has been agreed to by the patient, myelography with iodized oil has been carried out. If the myelography has been positive operation has been performed, but in a few cases we have operated, in spite of negative myelograms, because of severe and intractable pain.

Laminectomy may be necessary for extensive lesions, but in most cases of disk rupture we have used the interlaminar approach, usually combined with removal of the lower border of the upper lamina. This gives better access to the anterior part of the ligamentum flavum and to its lateral extension, the interpeduncular ligament. It is easy to remove the rest of the lamina if necessary, and this gives a good exposure of two roots. We find that our patients are little affected by this limited operation, and we usually allow them up after 12 days.

All of the 27 patients with disk protrusion were immediately relieved of pain. There has been one recurrence of protrusion 18 months after operation, and a second operation was done for this, with complete relief. Of the other conditions described, it is interesting to note that in all cases with a positive myelogram improvement followed operation. One case of spinal tumour showed signs of recurrence six months after operation. In the cases with negative myelograms no appreciable relief followed operation, but no patient was worse.

Summary

Fifty cases of lumbo-sacral root pain have been studied clinically, radiologically, and at operation, and the findings are described. In 54% of the cases the symptoms were due to protrusion of the fourth or fifth lumbar intervertebral disk, but we have described several other lesions which were found at operation.

Apart from operation, myelography is the only satisfactory diagnostic method for revealing and locating the lesion.

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MEDICAL RESEARCH IN EIRE

The Medical Research Council of Ireland has issued its report for the year 1945 from 85, Merrion Square, Dublin. The grant from the Hospitals Trust Board, guaranteed by the Minister for Local Government and Public Health for three years from January, 1944, was £5,000. As the period of this allocation of money will expire at the end of 1946 the Council has approached the Minister to make a substantial increase in the annual grant and to guarantee it for a much longer period. A big increase in applications for fellowships and studentships is anticipated now that more workers are becoming available to devote themselves to research, and it will be possible to send students abroad for training. The Council has decided to continue the goitre prophylactic scheme in the Clonmel and Kilsheelan areas in County Tipperary, where goitre is endemic, and it is hoped by the end of 1946 to have enough information to allow it to make definite proposals to the Public Health authorities for keeping this disease under control in the area. An investigation into the typhoid carrier condition was continued until the end of July, and the investigation into the chemotherapy of tuberculosis is progressing. By June of last year the Council had relinquished all control over the distribution and use of penicillin, the supply position to Eire having by that time become adequate for all requirements. The Committee appointed by the Council to advise the Minister for Local Government and Public Health on the establishment of dietary standards suitable to the Irish population held five meetings and submitted a detailed memorandum. Arrangements have been made for training field workers in methods necessary for carrying out the survey. During the year two studentships, five whole-time fellowships, and one part-time fellowship were awarded, and a number of grants-in-aid were authorized. The report concludes with a summary of work done by grant-holders during 1945.

TREATMENT OF SONNE III BACILLARY DYSENTERY AND BACILLARY DYSENTERY ("CLINICAL") WITH PHTHALYL SULPHATHIAZOLE

BY

J. BRODIE, M.D., D.P.H.
Lecturer in Bacteriology, University of St. Andrews, University College, Dundee

R. P. COOK, M.B., D.Sc.
Lecturer in Biochemistry, University of St. Andrews, University College, Dundee

CONSTANCE F. DRYSDALE, M.B., B.Sc.
Senior Resident Medical Officer, King's Cross Hospital, Corporation of Dundee

AND

D. G. McINTOSH, M.B., D.P.H.
Senior Assistant Medical Officer of Health, Corporation of Dundee

In a previous publication (Jamieson, Brodie, and Stiven, 1944) the clinical and bacteriological results obtained in 200 confirmed cases of bacillary dysentery of mixed type in Dundee were given. Although sulphaguanidine was found to produce results slightly superior, both clinically and bacteriologically, to those obtained with aperients and chalk, 30% of the cases treated with this drug were still bacteriologically positive in convalescence.

The present paper gives the results obtained by the treatment of 48 cases of Sonne III bacillary dysentery and 40 cases of "clinical" bacillary dysentery (i.e., cases showing blood and mucus in stools but from which no pathogenic organism was isolated) with phthalyl sulphathiazole. A note is also included on the possible prophylactic effect of the drug in a case which was cross-infected with Sonne III dysentery while convalescing from paratyphoid B fever.

Selection of Cases.—A specimen of faeces from each case admitted to King's Cross Hospital, Dundee, during the period August, 1944, to June, 1945, with a diagnosis of bacillary dysentery was examined bacteriologically on each of three successive days. Four days after cessation of treatment with phthalyl sulphathiazole, and provided clinical cure (see below) had been established, specimens of faeces were examined bi-weekly until three successive negative results were obtained. Cases yielding one or more positive results for the Sonne III bacillus either initially or during convalescence were placed in the bacteriologically confirmed group of cases: those yielding consistently negative results were placed in the clinical group.

Clinical Features.—Thirty-two of the 48 Sonne III cases and 28 of the 40 clinical cases were under 10 years of age. As in the previously reported cases, pyrexia was not a feature of the illness. Eight of the 48 Sonne III cases and one of the 40 clinical cases had a temperature greater than 100° F. (37.8° C.). In the Sonne III cases the stools showed blood and mucus in 30 and mucus in 18. Blood and mucus were present in the faeces of each case in the clinical group.

Method of Treatment.—Tablets of phthalyl sulphathiazole were crushed and given 4 times daily in water. Abundant fluids were administered by mouth, and a light diet was given during the first few days. The dosage used (see Table I) was one-half that employed for sulphaguanidine, on account of the lower solubility of phthalyl sulphathiazole. No toxic effects were observed in the 88 cases treated.

TABLE I.—*Dosage of Phthalyl Sulphathiazole*

Age in Years	Grammes per Day					Total in Grammes
	1st	2nd	3rd	4th	5th	
0–2	3	1	1	1	1	7
2–5	5	2	2	2	2	13
5–12	10	3	3	3	3	22
Over 12	15	4	4	4	4	31

Clinical Results of Treatment

Clinical cure was accepted as established on the disappearance of mucus and/or blood from the stool and return to normal consistence, maintained for a minimum period of 72 hours. The average periods required for clinical cure, after

the beginning of treatment, were: Sonne III cases, 8.73 days; clinical cases, 9.83 days. The least and greatest periods were respectively: Sonne III cases, 2 and 35 days; clinical cases, 3 and 21 days. Ten (20.8%) of the 48 Sonne III cases yielded a positive bacteriological result in convalescence (i.e., after the establishment of "clinical cure"). Relapse, which was regarded as the reappearance of mucus and/or blood in the stool after initial disappearance following treatment, occurred in 25 of the 48 Sonne III cases and 20 of the 40 clinical cases.

We were afforded the opportunity of testing the possible prophylactic effect of phthalyl sulphathiazole on the following patient, who was cross-infected with Sonne III bacillary dysentery.

A male child, aged 2½ years, who was convalescing from an attack of paratyphoid B fever and whose urine and faeces were positive for *B. paratyphosus* B, was given a total of 14 g. of the drug during 5 days (first day, 6 g.; next 4 days 2 g. daily). On the first day of treatment, and before any drug effect could have occurred, faeces and urine were reported negative for the first time. During the course of treatment, and for 7 days after cessation, daily specimens of urine and faeces were examined bacteriologically and negative results were obtained for *B. paratyphosus* B. Four days after the beginning of treatment the child developed diarrhoea, with blood and mucus in the faeces, and a culture of Sonne III bacillus was obtained. The drug did not appear to modify the course of the Sonne III infection. The stools were loose and contained blood and mucus for 10 days. Thereafter convalescence was normal and the faeces and urine yielded negative results for both the Sonne III bacillus and *B. paratyphosus* B.

Estimation of Phthalyl Sulphathiazole in Blood, Urine, and Faeces

On account of its low solubility considerable difficulty was experienced in estimating phthalyl sulphathiazole in body fluids and excretions. It should be emphasized that the values given are to be regarded as minimal. Whatever the shortcomings of the methods, the results from the faeces show clearly that the amount of phthalyl sulphathiazole as estimated is more than sufficient to saturate the water contained in the faeces, and hence the gut, with it, and the blood and urine analyses indicate that a small but definite absorption of the drug occurs.

To illustrate the difficulties a short account of the methods is given. The actual method of estimation employed was colorimetric, and was based on that of Bratton and Marshall (1939). The values given are for free phthalyl sulphathiazole; no estimations were made for the conjugated compound.

TABLE II.—*Concentration of Phthalyl Sulphathiazole (PST) in Faeces, Urine, and Blood*

Day After Starting Treatment	PST Content mg./100 g. Faeces	Type of Stool	Other Fluids Estimated
Case 1: G. W., aged 6. Non-specific Enteritis			
1	100	Fluid; mixed with urine	Urine: 1·33 mg./100 ml.
2	100	" " "	" 1·06 "
3	Nil	Small specimens containing mucus	" 5 "
4	185	Small; formed	Blood: trace only
5	205	Formed	—
6	200	"	—
Case 2: I. B., aged 32. Clinical Bacillary Dysentery			
1	Nil	Formed	—
2	333	"	—
3	Nil	Mucus only	Blood: nil
4	880	Mainly formed	—
5	1,000	Formed	—
6	1,430	Mucus present	Blood: nil
7	Nil	"	—
Case 3: Mrs. M. S. B. paratyphosus B Carrier; Diabetic			
1	Nil	Formed	Urine: 0·16 mg./100 ml.
2	—	No specimen	" 0·52 "
3	690	Formed	" 0·29 "
4	1,620	"	" 0·22 "
5	685	Mucus present	" 0·32 "
6	132	Fluid	" 0·16 "
9	Nil	Formed	" trace only

Standard Solutions.—The solubility of phthalyl sulphathiazole at neutrality is less than 200 mg. per litre—i.e., less than 0.02 g. per 100 ml. A stock solution was, however, made by dissolving 200 mg. in 1–2 ml. N/10 alkali and making up the volume to 1 litre. Standards were made from this stock solution, which was kept at 2° C., by diluting 1, 2, and 4 ml. to 100 ml. after the addition of 20 ml. of 10% trichloracetic acid: 10 ml. of these dilutions contain respectively 0.02, 0.04, and 0.08 mg. phthalyl sulphathiazole. This range of standards was used throughout.

Blood.—The phthalyl sulphathiazole was determined on the trichloracetic acid filtrate.

Urine.—A known amount was diluted to 100 ml. after the addition of 20 ml. of trichloracetic acid, and a 10-ml. aliquot was removed for estimation.

Faeces.—On account of the low solubility of phthalyl sulphathiazole a small amount of faeces to a large volume of extracting water had to be used. Two grammes of faeces were suspended in 1,000 ml. of water and the whole mass digested at 60° C. for 2 hours. At the end of this time 1–2 ml. of N/10 sodium hydroxide was added and the contents well shaken. Aliquots of 5, 10, and 20 ml. were then withdrawn and each separate aliquot made up to 100 ml. after the addition of 20 ml. of 10% trichloracetic acid. The acid mixtures were filtered and a 10-ml. aliquot was withdrawn in each case for estimation.

In Vitro Experiments with Phthalyl Sulphathiazole

A variety of micro-organisms were exposed to the action of phthalyl sulphathiazole at 37° C. for 24 hours. The media consisted of the C.C.Y. agar of Gladstone and Fildes (1940), semi-solid C.C.Y. agar, and Douglas broth, all having been saturated with phthalyl sulphathiazole before inoculation. Control tubes without phthalyl sulphathiazole were also employed. The micro-organisms used were: two strains each of *B. typhosus*, *B. paratyphosus* B (one of which had been isolated from Case 3—see Table II), *B. coli* (one strain each from a urine and a water-supply), and *B. dysenteriae* Flexner; and one strain each of Sonne III bacillus, *B. dysenteriae* var. Newcastle, and *B. proteus* X 19. Appreciable growths of all these bacteria were obtained on the C.C.Y. agar, especially *B. typhosus*, *B. coli*, and *B. paratyphosus* B, but in no instance was the growth as heavy as on the control tubes. It was noted that, whereas *B. proteus* swarmed well on the surface of the control tube, no swarming occurred when the agar contained phthalyl sulphathiazole.

When the semi-solid C.C.Y. agar and Douglas broth tests were examined it was noted that the bacteriostatic influence of the drug was more pronounced. Indeed, some of the bacteria failed to grow. Those which failed to grow by either cultural method were one of the Flexner strains, the Sonne III bacillus, and the *B. coli* from the urine.

During the *in vitro* experiments it was noted that phthalyl sulphathiazole was more soluble in Douglas broth than in water. Indeed, when enough phthalyl sulphathiazole was added to yield a 0.5% content, examination of the filtered fluid showed the presence of 0.4% of the drug.

TABLE III.—*Comparison of Treatments for Bacillary Dysentery*

Treatment	No. of Cases		Av. Time in Days Required for "Clinical Cure"		Cases Positive Bacteriologically in Convalescence			
					Sonne III		Total	
	Sonne III	Total	Sonne III	Total	No.	%	No.	%
Aperients ..	11	50	6·3	6·5	4	36·4	25	50
Chalk	18	50	7·6	6·0	11	61·1	26	52
Sulphaguanidine	10	100	4·7	5·0	4	40·0	30	30
Phthalyl sulphathiazole	48	—	8·73	—	10	20·8	—	—

Discussion

The paper by Jamieson, Brodie, and Stiven (1944) dealt with 200 cases of bacteriologically confirmed bacillary dysentery of mixed type, of which 39 were Sonne III infections. In Table III we have contrasted the effects of various treatments in their cases with the effect of treatment with phthalyl sulphathiazole. The results indicate that phthalyl sulphathiazole is the least effective agent in producing clinical recovery, although the number of cases positive bacteriologically in convalescence is less than those recorded by the other methods. Our findings may also be compared with those of Swyer (1943), who treated 57 cases of Sonne dysentery, 48 of which patients were aged 10 years and less, with sulphapyridine; 35 cases—25 of them

aged 10 years and less—were used as controls. Swyer states that there was little or no toxaemia or dehydration in either group. In the treated cases only 4 of the 57 had pyrexia ranging from 100 to 102° F. (37.8–38.9° C.) and lasting 1 to 3 days, while in the control group similar pyrexia occurred in 13 of the 35 cases. As regards both age and clinical features these cases offer a fairly satisfactory group for a broad comparison with our cases. The stools remained clinically abnormal in the treated group for an average period of 9 days, which is in agreement with our findings, compared with 20 days for the control group. Owing to the different standards used, it is not possible to compare our bacteriological results with those of Swyer, who found that in the chemotherapy group the time required to obtain bacteriological clearance was 5 days, compared with 21 days for the control group.

The high incidence of relapse (25 of 48 Sonne III cases, 20 of 40 clinical cases) is considerably greater than that noted by Jamieson, Brodie, and Stiven (1944), who found that relapse was fairly constant in their three groups of cases, the figures being as follows: 10 of 100 cases treated with sulphaguanidine; 5 of 50 cases treated with aperients; and 4 of 50 cases treated with chalk. In the present investigation the criterion adopted for relapse was a very rigid one: any patient showing an amount of mucus other than a mere trace was designated a clinically relapsed case. Of 25 cases which relapsed 7 (28%) yielded a positive bacteriological result in convalescence, compared with 3 (13%) of the 23 cases which did not relapse.

Owing to the mild nature of the majority of cases of bacillary dysentery the effect of different methods of treatment is difficult to evaluate—a fact to which Scadding (1945) has drawn particular attention. Brewer (1944) refers to 16 clinically recovered cases of Sonne dysentery, 9 of which had already received sulphaguanidine and 7 symptomatic treatment. So far as clinical cure was concerned, sulphaguanidine had not appeared to influence the course of the disease. He found that subsequent treatment with 44 g. of succinyl sulphathiazole (sulphasuxidine) over 5 days was effective in producing a negative stool in each of the 16 cases except one which needed two such courses. Hardy, Burns, and De Capito (cited by Poth and Ross, 1944) found that succinyl sulphathiazole was effective in preventing the development of bacillary dysentery carriers. Scadding (1945) cites the report by Roberts and Daniells in which 89 mild Flexner cases treated with succinyl sulphathiazole showed no significant difference compared with 136 similar control cases, except that there was a reduction in the convalescent carrier rate of the treated cases. Scadding's (1945) observation that succinyl sulphathiazole and sulphadiazine did not give results significantly superior to sulphaguanidine led to the institution of an investigation which showed that there was no statistical difference between sulphaguanidine-treated cases and untreated control cases so far as duration of diarrhoea and length of stay in hospital were concerned. Fairbrother (1944) states that although Sonne III dysentery is of mild type the carrier state after clinical recovery is common. He records the significant observation that approximately 60% of 76 Sonne cases which received no sulphonamide but only ordinary routine treatment became bacteriologically clear within three weeks. When employed in cases which had become carriers succinyl sulphathiazole and sulphaguanidine did not yield satisfactory results. Vollum and Wylie (1946), who claim that succinyl sulphathiazole is the best available drug for the control of Sonne dysentery, suggest that the unsatisfactory results obtained by Fairbrother were due not to persistence of Sonne infection but to reinfection; but, as Fairbrother (1946) points out in reply, the failures in his series were adults under Service conditions who were in hospital (isolated in side-rooms) during treatment. *In vitro* experiments by Fairbrother (1944) showed that Flexner and Sonne strains were inhibited by succinyl sulphathiazole, while sulphaguanidine was relatively ineffective. This confirmed the earlier work of Brewer (1944) so far as Sonne strains were concerned. Poth and Ross (1944) showed that phthalyl sulphathiazole possessed roughly twice the bacteriostatic effect of succinyl sulphathiazole in reducing coliform organisms in the intestinal tract of man. Poth (cited by Poth and Ross, 1944) found that phthalyl sulphathiazole was highly specific in the treatment of Flexner dysentery. It was further shown by Poth and Ross (1944) that patients suffering from diarrhoea, but in whom *Shigella paradysenteriae* organisms could not be identified, frequently responded to phthalyl sulphathiazole. Only rarely were positive stools found in follow-up cultures.

Since the criterion used by Fairbrother (1944) for bacteriological cure (12 successive daily negative cultures) is a more stringent one than that used in this investigation our results are not comparable with his. They may be compared, however, with the earlier findings of Jamieson, Brodie, and Stiven (1944). As shown in Table III, the number of cases bacteriologically positive in convalescence, in the cases treated with phthalyl sulphathiazole, is considerably lower than those recorded both for their 39 Sonne III cases and for their 200 mixed cases.

Summary

The results of treatment of 48 cases of Sonne III dysentery and 40 cases of bacillary dysentery ("clinical") with phthalyl sulphathiazole are given. The average periods required for the establishment of clinical cure were 8.73 days for the Sonne III cases and 9.83 days for the "clinical" cases. The results obtained in the former group were inferior when compared with those obtained by Jamieson, Brodie, and Stiven (1944), who treated 200 mixed cases of bacillary dysentery, of which 39 were Sonne III infections, with sulphaguanidine, aperients, and chalk, the corresponding figures for clinical cure being 5.0 days, 6.5 days, and 6.0 days respectively for the total group, and 4.7 days, 6.3 days, and 7.6 days for the Sonne III cases. On the other hand, our results are in agreement with those obtained by Swyer (1943), who found that the stools of 57 Sonne III cases treated with sulphapyridine remained abnormal for 9 days, compared with 20 days for a control group of 35 cases.

The incidence of clinical relapse was high in the cases treated with phthalyl sulphathiazole, being found in 25 of 48 Sonne III cases and 20 of 40 clinical cases. Seven (28%) of the 25 cases which relapsed yielded a positive bacteriological result in convalescence, compared with 3 (13%) of 23 cases which did not relapse.

Ten (20.8%) of the 48 Sonne III cases treated with phthalyl sulphathiazole gave a positive bacteriological result in convalescence, which is considerably lower than the figures quoted by Jamieson, Brodie, and Stiven (1944). For their 200 mixed cases the figures were: sulphaguanidine cases, 30%; aperient cases, 50%; chalk cases, 52%. For their 39 Sonne III cases the corresponding figures were: 40.0%, 36.4%, and 61.1%.

Reference is made in the discussion to the fact that the mild nature of cases of bacillary dysentery renders evaluation of the effects of different therapeutic agents difficult. The observations of Fairbrother (1944) and of Scadding (1945) are especially apposite in this connexion.

The dosage of phthalyl sulphathiazole shown in Table I was based on age; and the results of analyses of faeces, urine, and blood showed that: (*a*) saturation of the gut contents was achieved; (*b*) small but definite absorption of the drug occurs. No toxic effects were observed in the 88 cases treated.

In vitro experiments showed that phthalyl sulphathiazole exerts a bacteriostatic effect against a number of intestinal organisms. A Flexner strain, a Sonne III organism, and a strain of *B. coli* were completely inhibited in semi-solid and fluid media containing the drug.

The resuits of the present investigation indicate that, while phthalyl sulphathiazole did not appreciably influence the clinical course of Sonne III dysentery, it reduced considerably the number of cases bacteriologically positive in convalescence.

We desire to acknowledge our thanks to Dr. W. L. Burgess, C.B.E., and Prof. Tulloch, O.B.E., for granting us facilities for this investigation, and to Messrs. May and Baker for kindly supplying the phthalyl sulphathiazole. We greatly appreciate the assistance given us by Sister Elder, of King's Cross Hospital.

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A message from Washington states that to advance an expanding physical restoration programme the Office of Vocational Rehabilitation, Federal Security Agency, has acquired the services of five new medical officers and contemplates filling additional full-time posts in the fields of ophthalmology, hospital administration, tuberculosis, and psychiatric social work. Dr. Victor H. Vogel of Denver, surgeon in the U.S. Public Health Service, has been named chief medical officer of the Office of Vocational Rehabilitation.

BACTERIOLOGY OF STOMACH AND DUODENUM IN CASES OF PEPTIC ULCER AND GASTRIC CARCINOMA

BY

MARY BARBER, M.D.

AND

R. H. FRANKLIN, F.R.C.S.

(From the Departments of Surgery and of Pathology, British Postgraduate Medical School)

Unexplained sepsis, which occasionally occurs after apparently straightforward cases of partial gastrectomy, may lead to the development of a subdiaphragmatic abscess or, more rarely, to general peritonitis and death. It has been noted that the tissues surrounding a chronic peptic ulcer are often oedematous, the neighbouring lymph-nodes may be enlarged, and in short the clinical picture may be one of inflammation. The present investigation was undertaken to determine whether any pathogenic bacteria were present in the stomach and duodenum at the time of operation.

The normal bacterial flora of the alimentary tract has been the subject of much work and even more discussion. Billroth (1874) demonstrated that the meconium of newborn infants was sterile and that bacteria appeared with the first yellow stools. Escherich (1885) confirmed this, and showed that the interval elapsing before the appearance of organisms was dependent on when the earliest feed was given. He also established the colon bacillus as the characteristic intestinal organism. Where these bacteria come from, and whether they enter via the mouth or the anus, were for some time subjects of conjecture. In 1900 Cushing and Livingood summed up the evidence then available and concluded that food was the most important source. More recently many studies have been made on the effect of diet on the intestinal flora. Cannon and McNease (1923) found that in rats on a high protein diet the *p*H of the contents of the caecum and colon was 7.0–7.1, and the bacterial flora consisted mainly of proteolytic types, whereas the addition of lactose lowered the *p*H of the intestinal contents and with an increasing acidity the proteolytic bacteria were replaced by aciduric organisms such as *B. acidophilus*. Sanborn (1931a, 1931b) studied the bacteria present in the faeces of adult patients in the Boston Psychopathic Hospital when on various diets. He stated that "a diet high in carbohydrate and one high in meat protein tend to simplify the aerobic flora, respectively, in the acidophilic and the colonic direction." He found, however, that the degree to which this transformation took place varied very much with different individuals, and he concluded that the normal intestinal flora was not simply dependent on age and diet, but was dependent also on the "metabolic characteristics" of the individual.

Action of Bacteria in the Alimentary Tract

Another aspect which has caused considerable controversy is the importance of bacteria in the alimentary tract. Levin (1899) says that Pasteur in 1880 posed the question whether bacteria are essential for digestion. Nuttall and Thierfelder (1895) succeeded in keeping alive and well for eight days a guinea-pig obtained by Caesarean section, confined in a sterile chamber, breathing sterilized air, and fed on sterilized milk. After eight days the animal was killed and the intestines were shown to be free from bacteria. Levin (1899) went to Spitsbergen to study the bacteriology of the Arctic regions. He investigated the intestinal contents of white bears, reindeer, and seals, and found them usually sterile. This he correlated with the great rarity of bacteria in the air and water of the Arctic. The latter contained less than one organism in 11 ml., as opposed to 600,000 per ml. in the Seine. Cohendy (1912) finally proved that animals normally having bacteria in their intestines can survive without them. He reared chicks under sterile conditions for from 12 to 40 days, and found that they developed as well as control chicks, although the food of the former was rather less well digested. For some time after this it was thought that bacteria in the intestinal canal served no useful purpose and were possibly even harmful. In the last few years, however, a new function has been assigned to them—namely, synthesis of vitamins. The ability of many intestinal bacteria to synthesize members of the vitamin B complex *in vitro* is beyond doubt (see Burkholder and McVeigh, 1942). Evidence is now accumulating to show that the biosynthesis of vitamins in the human intestine is by no means negligible. Adolescent males kept on carefully controlled diets deficient in thiamine (Najjar and Holt, 1943) and riboflavin (Najjar *et al.*, 1944) continued in many cases to excrete these substances in normal quantities in the faeces. Ellinger *et al.* (1945) found there was a gross discrepancy between the intake and output of nicotinamide in healthy adults, and that the urinary secretion was reduced by 60%, if the subjects were given succinyl sulphathiazole (sulphasuxidine). From these experiments it cannot be concluded that the intestinal bacteria are necessarily beneficial, as under certain conditions *in vitro* many intestinal bacteria destroy vitamin C (Young, 1942; Young and James, 1942; Young and Rettger, 1943), and organisms of the *Pseudomonas* group will decompose nicotinic acid if that is the only organic compound in the medium (Koser and Baird, 1944). Benesch (1945) obtained a sample of mixed caecal flora from a patient with a caecostomy. He found that under aerobic conditions nicotinic acid was synthesized, and under anaerobic conditions two-thirds of the nicotinic acid present in the original medium was destroyed. Clearly the possible activities of bacteria in the intestines under different conditions are legion and remain a matter for speculation.

Antiseptic Properties of Gastric Juice

In contrast to the prolific flora of the large intestine, the stomach and early duodenum in the healthy adult are usually sterile, except just after a meal. Spallanzani (1783) was the first to draw attention to the antiseptic properties of gastric juice. He demonstrated that "les chairs enfermées avec le suc gastrique ne sont point sujettes à la pourriture." Cushing and Livingood (1900) reviewed a series of cases of gunshot wounds of the abdomen perforating the gut, and found that only those patients survived in whom the lesion was near the pylorus—lesions lower in the alimentary tract leading to peritonitis. This they attributed to the antiseptic action of the gastric juice. Hewetson (1904) gave himself cultures of *Staph. aureus* and *citreus* and *Ps. pyocyanea* via a stomach-tube and then examined samples of gastric juice every 15 minutes. The cocci were found to be killed in 30 to 45 minutes, and the bacilli in 60 to 90 minutes. He noticed no ill effects, and subsequently planted similar cultures in the stomachs of several patients with gastrostomies, obtaining similar results. Knott (1923) correlated the efficiency of gastric juice as a germicidal barrier with the concentration of free hydrochloric acid present, and determined the concentration of the latter necessary to kill various bacteria. He concluded that sporing bacilli and resistant coliforms would easily survive gastric juice; that the typhoid and dysentery group and staphylococci would survive only if the free hydrochloric acid content was low; that *Str. pyogenes, Str. viridans, C. diphtheriae,* and *M. catarrhalis* would pass through to the duodenum only in conditions approaching achlorhydria. Knott and Venables (1924) showed that in 90% of cases with normal gastric acidity the duodenal contents were sterile, whereas Knott (1927) found that 37 patients with pernicious anaemia and achlorhydria all had bacteria in the duodenum. Garrod (1939) showed that susceptibility to the bactericidal action of hydrochloric acid of any pathogenic bacteria entering the body via the alimentary tract varied considerably, and that gastric juice was more bactericidal than hydrochloric acid of equivalent strength.

In gastric disease it has repeatedly been shown that bacteria may actually multiply in the stomach. In 1842 Goodsir described a case "in which a fluid periodically ejected from the stomach contained vegetable organisms of an undescribed form." He described the bacterium in some detail, and suggested for it the name *Sarcina ventriculi*. Gillespie (1893) isolated 24 different organisms from the stomach by means of a stomach-tube. Hewetson (1904) seems to have been the first to study material taken direct from the stomach at operation. He took cultures from the stomach in 36 cases and from the jejunum in 29; 18 of the former and 16 of the latter were sterile. A variety of bacteria were isolated from the rest, but, owing to the fact that they caused no ill effects when injected into rodents, he concluded that they were harmless.

More recent work on the bacteriology of the stomach and duodenum has been carried out mainly to answer two questions: first, whether infection plays a part in the causation of peptic ulcers; and, secondly, whether post-operative sepsis is related to the bacteria present in the stomach at the time of operation. According to Bolton (1913), Böttcher in 1874 demonstrated bacteria in the edges and floor of gastric ulcers and suggested direct infection from the stomach cavity. That bacteria can produce stomach and duodenal ulcers in rodents has been shown by many workers. Some of the earliest results in this line are those of Lettulle (1888), with *Staph. aureus*; Chantemesse and Widal (1888), with a dysentery bacillus; and Charrin and Ruffer (1889), with a filtrate from *Ps. pyocyanea*. Rosenow and Sandford (1915) found streptococci (usually *viridans*) in a very high proportion of peptic ulcers, and Rosenow (1916, 1923) showed that a high percentage of these bacteria, and also cultures of *Str. viridans* isolated from dental infection in ulcer patients, had a "characteristic affinity" for the stomach and duodenum, leading to ulcers in these organs on injection into dogs, monkeys, rabbits, guinea-pigs, and mice, whereas streptococci isolated from other patients did so much less frequently. Similar results were obtained by Christophe (1922), Nakamura (1924), Haden and Bohan (1925), and Nickel and Hufford (1928).

Löhr (1924) was interested in the fact that the free fluid found in the abdomen after perforation of a peptic ulcer was frequently sterile. He studied the contents of the stomach and duodenum obtained at operation from 200 cases; the contents were sterile in 82% of 56 cases of gastric ulcer, in 92% of 40 cases of duodenal ulcer, and in only 78% of 46 cases of gastric carcinoma. Appelmans and Vassiliadis (1932) cultured portions of ulcer obtained at operation from 60 cases. Bacteria were isolated from 13 of 23 duodenal ulcers, 14 of 17 gastric ulcers, and all of 18 gastric carcinomas. The organisms isolated were, in order of frequency, staphylococci, streptococci, yeasts, coliform bacilli, *B. mesentericus*, and lactic acid bacilli. Seley and Colp (1941) investigated the bacteriology of the stomach and duodenum in a series of cases undergoing partial gastrectomy. Actual portions of mucous membrane of these organs were cultured with a view to determining whether post-operative sepsis could in some cases be attributed to bacteria present at the time of operation. Positive cultures were obtained in 93.7% of "gastric malignancies," 83.3% of gastric ulcers, 36.6% of duodenal ulcers, and 37.9% of secondary peptic ulcers. Bacteria regarded as pathogenic, including *Str. haemolyticus*, *Str. viridans*, non-haemolytic streptococci, *Cl. welchii*, and *Bact. coli*, were isolated from 88% of the "malignancies" and 30% of the benign ulcers. The high percentage of pathogenic organisms in carcinoma cases was correlated with a low average gastric acidity, and the incidence of post-operative complications and mortality appeared higher in these cases. Priestley *et al.* (1944) examined the gastric contents taken at operation from 41 cases. The contents were sterile in 18 of 22 cases of duodenal ulcer, in 1 of 7 cases of gastric ulcer, and in none of 5 carcinomas. Test meals done before operation showed that bacteria were seldom isolated if the level of total gastric acidity was 40 units or higher. The organisms isolated were "green-producing streptococci," micrococci, and Gram-negative bacilli. In spite of this voluminous literature the number of studies where organisms were taken direct from the stomach and duodenum at operation and the bacteria isolated were fully identified is small.

Experimental Tests

In the present study swabs were taken from the mucosa of the stomach and duodenum at operation on a series of 50 patients undergoing partial gastrectomy. Each swab was inoculated on to two blood-agar plates, one of which was then inoculated aerobically and the other anaerobically. Bacteria appearing on these plates were isolated in pure culture and, where possible, identified. In most cases test meals were done before operation and a portion of ulcer was examined histologically.

Table I correlates the gastric condition with the number of positive bacteriological results; in 9 out of 10 cases of gastric carcinoma bacteria were isolated from the stomach alone or stomach and duodenum; the gastric ulcer cases show a lower proportion of positive results, and both swabs were sterile from all of 12 cases of duodenal ulcer.

Table II gives a list of the bacteria grown and the number of times each was isolated in cases of simple ulcer and carcinoma. The last column shows the highest concentration of free hydrochloric acid found in the resting juice, taken before operation, of any patient from whom that particular organism was cultivated. The non-haemolytic streptococci included typical *Str. faecalis* and other types. The coliform bacilli were mostly *Bact. coli*, but *Proteus* and *B. faecalis alcaligenes* were also isolated.

TABLE I

	Simple Ulcers			Gastric Carcinomas	Total
	Gastric Ulcers	Jejunal Ulcers	Duodenal Ulcers		
Stomach and duodenum sterile	12	0	12	1	25
Micro-organisms isolated from stomach; duodenum sterile	11	1	0	6	18
Micro-organisms isolated from stomach and duodenum	4	0	0	3	7
Total	27	1	12	10	50

TABLE II.—*Micro-organisms isolated*

Organism		Simple Ulcers	Gastric Carcinomas	Highest Conc. of Free HCl in Gastric Resting Juice
M. albicans ..	From stomach; 11 cases	9	2	61
Str. viridans ..	„ stomach; 9 „	6	3	0
	„ duodenum; 3 „	3	0	0
Non-haemolytic streptococci	„ stomach; 7 „	2	5	42
	„ duodenum; 2 „	0	2	84
Coliform bacilli ..	„ stomach; 7 „	1	6	84
	„ duodenum; 3 „	1	2	84
Staph. albus ..	„ stomach; 4 „	3	1	5
	„ duodenum; 1 case	1	0	0
Neisseriae ..	„ stomach; 4 cases	3	1	0
	„ duodenum; 1 case	1	0	0
Str. pneumoniae ..	„ stomach; 4 cases	2	2	0
Diphtheroid bacilli	„ stomach; 2 „	1	1	Not tested
	„ duodenum; 1 case	1	0	„
Staph. aureus ..	„ stomach; 2 cases	2	0	0
Str. pyogenes ..	„ stomach; 1 case	0	1	0
(Lancefield Group A)	„ duodenum; 1 „	0	1	0
Lactobacilli ..	„ stomach; 1 „	0	1	0

Discussion

M. albicans, non-haemolytic streptococci, and coliform bacilli were isolated from many patients who had a normal or high gastric acidity. All other bacteria were isolated only from cases where the test meal showed a condition approaching achlorhydria. In this series of 50 cases septic post-operative complications were no higher among the 25 cases with positive cultures than among the other 25. The isolation, however, of such organisms as *Str. pneumoniae*, *Staph. aureus*, and Lancefield A haemolytic streptococci makes it clear that bacteria in the stomach at the time of operation are a potential source of infection, and pre-operative medication might be advisable at least in those cases with low gastric acidity.

Summary

Swabs for bacteriological examination were taken direct from the mucosa of the stomach and duodenum at operation in 50 cases undergoing partial gastrectomy for peptic ulcer or gastric carcinoma. Bacteria were isolated from 16 of 40 cases of benign ulcer and 9 of 10 cases of carcinoma. Pyogenic cocci (*Str. pneumoniae*, *Staph. aureus*, and Lancefield A haemolytic streptococci) were isolated from 7 cases.

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TREATMENT OF BRANCHIAL CLEFT CYSTS BY ASPIRATION AND INJECTION OF PURE CARBOLIC ACID

BY

T. FRANCIS JARMAN, M.D.

Deputy Tuberculosis Physician, Welsh National Memorial Association; Deputy Medical Superintendent, Cymla Tuberculosis Hospital, Neath

The occurrence of branchial cysts is relatively rare. The most common mistake in diagnosis is to confuse the condition with an abscess resulting from breaking-down tuberculous glands. In a study of 42 branchial cysts and 9 branchial fistulae, in which incorrect diagnosis was made in 42% of cases, Shedden (1931) reports that 12% were diagnosed as tuberculous glands in the neck. Hamilton Bailey (1928) reports 11 cases of branchial cyst in which this mistake was made, and one very interesting case in which tubercle bacilli were found both in the wall of a branchial cyst and in its fluid contents.

Diagnosis

According to Shedden (1931) branchial cysts occupy a constant anatomical position. They lie in relationship to the deep surface of the upper half of the sterno-mastoid, and nearly always protrude around the anterior border of this muscle. Most commonly the centre of the cyst is opposite the greater cornu of the hyoid bone. In the six cases reported here the swellings were hard and tense, giving an impression of induration rather than of being cystic and fluctuant. Bailey (1923) remarks that all branchial cysts which give rise to symptoms are lined with squamous epithelial cells, and that so-called "mucous branchial cysts" lined with columnar epithelium are in reality cystic hygromas. He states, further, that the presence of cholesterol crystals in aspirated fluid is diagnostic of a branchial cyst. Two other factors, noticed when aspiration is performed, appear to me to indicate a branchial cyst rather than a tuberculous abscess: (*a*) that the fluid content is very thin, and (*b*) that the cyst can almost always be completely emptied at the first aspiration.

The cases here reported were diagnosed as tuberculous cervical adenitis, and were referred to me for treatment of that condition. The diagnosis of branchial cyst was subsequently made in each case on the finding of squamous epithelial cells during examination of aspirated fluid at the Central Tuberculosis Laboratory, Cardiff.

Treatment

The treatment generally recognized as being the only satisfactory one is complete excision (Shedden, 1931; Bailey, 1923, 1928; Baumgartner, 1933). Cutler and Zollinger (1933) report several cases of cervical fistulae and pilonidal cysts treated by a modified Carnoy's solution containing absolute alcohol 6 ml., chloroform 3 ml., glacial acetic acid 1 ml., and ferric chloride 1 g. Robitshek (1933) records a case of branchial fistula successfully treated in this way. Five of the six cases reported below were treated by aspiration followed by the injection of from 0.5 to 1 ml. of pure carbolic acid. In one case the cyst disappeared after a single aspiration without the injection of any sclerosing fluid, but recurred 8 months after this aspiration. Aspiration was made with a moderately fine needle, which was held carefully in place to receive the Record syringe containing the carbolic acid. After aspiration, which in every case caused complete flattening of the cystic swelling, the acid was injected with maximum rapidity in order to obtain a spraying effect with the carbolic on the lining of the cyst wall. Firm pressure was then maintained on the site of the emptied cyst for five or ten minutes.

Case Reports

Case 1.—A man aged 31 was admitted with a very large hard mass in the left side of the neck deep to the upper third of the sterno-mastoid; on Feb. 13, 1943, 25 ml. of rather thin yellowish fluid was aspirated and the swelling completely flattened. On Feb. 27 the swelling reappeared, and 5 ml. of fluid was aspirated. The laboratory report (Dr. Ruth Milne) on the aspirated fluid stated: "No acid-fast bacilli found. The presence of many epithelial cells suggests that the pus may be from a simple branchial cyst. The character of the fluid is also suggestive but not absolutely typical of this." March 20: Swelling very large and hard again; 20 ml. of fluid aspirated, and swelling completely flattened again; 0.5 ml. of pure carbolic acid injected. March 27: Swelling now very small. April 10: Swelling hardly palpable. May 1: Swelling completely gone. Seen in January, 1945, and March, 1946, the patient stated that there had been no recurrence.

Case 2.—A woman aged 41 was admitted on April 2, 1943, with a hard tense swelling in the right side of the neck; 10 ml. of brownish fluid aspirated from the cyst and swelling completely flattened. Laboratory report (Dr. Milne): "No tubercle bacilli. Squamous epithelial cells present in large numbers. Findings typical of a branchial cyst." This case was kept as a control and no carbolic acid was injected. The cyst showed no signs of filling up until Dec. 6. The swelling recurred, and by Jan. 10, 1944, had reached the same size as when originally seen. It was aspirated and 12 ml. of brownish fluid withdrawn. This fluid was again reported on as being characteristic of a branchial cyst. This time, however, 1 ml. of pure carbolic acid was injected after aspiration. Three months later only a small firm swelling was present near the anterior border of the sterno-mastoid. Jan. 29, 1945: No palpable swelling present. March 1, 1946: No recurrence.

Case 3.—A man aged 26 was admitted on Aug. 18, 1943, with a large hard tense mass in the upper half of the right side of the neck, deep to the sterno-mastoid: 12 ml. of thin greenish-yellow fluid aspirated from the swelling. Laboratory report on the fluid (Dr. Milne): "No tubercle bacilli present. Large numbers of squamous epithelial cells. Findings typical of branchial cyst." Sept. 4: Swelling up again; 6 ml. of fluid aspirated; 0.5 ml. of pure carbolic injected. Sept. 18: Swelling much smaller, but up again; 4 ml. of fluid aspirated; 1 ml. of pure carbolic acid injected. Dec. 13: Now has a small firm swelling near the anterior border of the sterno-mastoid. Jan. 10, 1944: A tiny hard nodule only is palpable. Jan. 29, 1945: No mass or nodule palpable. April 20, 1945, and March 1, 1946: No recurrence.

Case 4.—A young woman aged 22 was admitted on March 3, 1944, with a tensely fluctuant swelling in the upper half of the left side of the neck; 16 ml. of brownish thin fluid aspirated. Laboratory report on fluid (Dr. Milne): "No tubercle bacilli present. Large numbers of squamous epithelial cells observed. Findings typical of branchial cyst." April 28: Swelling up again; 18 ml. of fluid aspirated and swelling completely flattened; 1 ml. of pure carbolic injected. May 12, 1944: Small hard mass palpable. July 21: Swelling completely gone; nothing to palpate. Jan. 22, 1945: No palpable swelling. April 23, 1945, and March 1, 1946: Follow-up; no recurrence.

Case 5.—A young woman aged 23 was admitted on March 3, 1944, with a large tensely fluctuant swelling in the left side of the neck; 15 ml. of thin yellowish fluid aspirated from the swelling. Laboratory report on the fluid (Dr. Milne): "No tubercle bacilli; large numbers of squamous epithelial cells. Findings typical of a branchial cyst." March 10: 5 ml. of fluid aspirated; 1 ml. of pure carbolic injected. April 28: Swelling completely gone. May 26: Swelling still absent; nothing at all abnormal to palpate. Jan. 29, 1945: Swelling reappeared a week ago. A very hard swelling the size of a walnut present. Aspiration attempted but no fluid obtained. Diagnosis doubtful. Feb. 10: Swelling has disappeared; may have been a lymphadenitis. April 30: No palpable swelling. March 3, 1946: No recurrence.

Case 6.—A girl aged 12 was admitted on Dec. 22, 1944, with a fairly tense cystic swelling in the left side of the neck, deep to the

upper half of the sterno-mastoid; 25 ml. of buff-coloured fluid aspirated and swelling completely flattened. Laboratory report: "Fluid contains large numbers of squamous epithelial cells and is typical of a branchial cyst." Jan. 5, 1945: Swelling has recurred, but is not so large as when first seen; 12 ml. of fluid aspirated and swelling again completely flattened; 1 ml. of pure carbolic acid injected. Jan. 19, 1945: Swelling again present, but now very small and indurated. Feb. 9: A small firm mass, the size of a hazel nut, is palpable deep to the upper third of the sterno-mastoid. March 22: Swelling completely gone. April 30, 1945, and March 1, 1946: No recurrence.

Discussion

No untoward reactions of any kind have been encountered after this treatment. Shedden (1931) reports that iodine, alcohol, caustic potash, trichloracetic acid, and mercuric nitrate have all been injected into branchial fistulas in attempts to close them, sometimes with fatal results after passage of these substances along the fistula into the mouth. I cannot find any reference, however, in the literature to the use of sclerosing solutions in the treatment of branchial cysts. Trail, in a personal communication in 1944, reported the disappearance of a branchial cyst following its aspiration and the injection into it of lipiodol for purposes of radiological study. It would seem that branchial cysts have no fistulous connexion with the mouth (Bailey, 1923). Baumgartner (1933), however, describes a form of "incomplete internal" fistula with an internal but no external opening which could presumably become cystic and in which the injection of pure carbolic acid might carry some risk. This is, I believe, far more of a theoretical than an actual practical risk, and one which could be overcome by careful scrutiny of the mouth after the injection of methylene-blue solution into the cyst.

The follow-up in these cases is too short to be certain that recurrence will not take place but is long enough to make such a conclusion reasonable.

Summary

Six cases of branchial cyst are reported. They were treated by aspiration followed by the injection of from 0.5 to 1 ml. of pure carbolic acid. In every case the swellings disappeared and have not, so far, recurred. One of the cases was first treated by aspiration alone, but the cyst recurred after 8 months. It was subsequently treated as above, and has not recurred since.

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Medical Memoranda

Post-operative Mania treated by Continuous Intravenous Pentothal

Little has been written about the action and effects of sodium pentothal, even as a short-acting anaesthetic. By the following case it is hoped to illustrate the possibilities of prolonged narcosis produced and sustained by this drug. It would seem that modifications of the method as shown below may be used in the treatment of other disorders of a nervous nature.

Case History

The patient, an ex-officer in the Merchant Navy aged 24, gave a history of peptic ulceration dating back to 1939. From September, 1943, to July, 1945, he had had four operations—two for perforations and one each for gastro-jejunostomy and laparotomy. After the last operation he was violent and confused, and had to be restrained, but this lasted for only 24 hours. He was left with no obvious mental trauma. After two months' hospital treatment a partial gastrectomy was performed in September, 1945.

Some facts involving the patient's psychological state are of interest. He underwent many hardships on the Murmansk convoys, and on one of these his ship was torpedoed. As a result he was very nearly drowned and lost the thumb and three fingers of his left hand. His wife had a baby four weeks before his present operation, and about the same time he lost the job which he had held since his discharge from the Service a year ago. He smokes 15 to 20 cigarettes daily, but takes no alcohol.

The patient is a well-built, healthy-looking man, introspective and rather "highly strung." He requires a lot of attention and is obviously "spoilt." His general physical condition is good. The handicap of his left hand does not worry him unduly, and he has overcome it to a great extent. Examination of his C.N.S. revealed no abnormality. The day before his operation he was very well, and looking forward to the benefit which he was to receive from it. That night he slept well without sedation.

Sept. 7, 1945.—8.30 a.m.: Premedication—omnopon 1/3 gr. (22 mg.) and hyoscine 1/150 gr. (0.44 mg.). 10.10–11.30 a.m.: At operation the gastro-enterostomy was undone and a partial gastrectomy carried out. Anaesthesia was induced with intravenous pentothal 0.5 g., and thereafter he was given nitrous oxide, oxygen, and ether. Induction and anaesthesia were smooth and uneventful, and at no time was he cyanosed. 2.15 p.m.: Coming out of the anaesthetic; restless; omnopon 1/3 gr. 4 p.m.: Continuing restless; 4 dr. (14 ml.) rectal paraldehyde given without effect. 6 p.m.–2 a.m.: 1½ gr. (0.1 g.) of morphine in 1/4-gr. (16-mg.) doses. Patient now very violent and having hallucinations of torpedoes and sensations of fear of drowning. A restraining sheet failed to control him.

Sept. 8.—3.15 a.m.: Omnopon 2/3 gr. (45 mg.) and hyoscine 1/75 gr. (0.87 mg.). Very little effect. Pulse rate rising, but colour remains good. 10.20 a.m.: As the patient's condition in some ways resembled delirium tremens 3 ampoules of vitamin B, were given intravenously. An hour later he was more violent than before. He was out of bed on several occasions, being almost uncontrollable. 12.40 p.m.: Slept for one hour after 33½ gr. (2.2 g.) sodium amytal intravenously. 2.50 p.m.: Slept for a further hour after 6 dr. (21 ml.) rectal paraldehyde, some of which was returned. 4.30 p.m.: Began to retch violently, then vomited some clotted blood. Was not obstreperous but quite uncooperative. Pulse and colour remained good. 6 p.m.: At this point it was agreed that he would have to be put to sleep or he would die from exhaustion. Since hypnotics were apparently useless, it was decided that sodium pentothal intravenously was the most effective and suitable narcotic. Consequently sleep was induced by the injection of 0.5 g. as for induction of anaesthesia. A glucose-saline drip was then set up, containing 1 g. of pentothal to 1 pint (568 ml.) of glucose-saline. The rate of drip was determined by the depth of the narcosis, 40 drops a minute being required on an average to keep him narcotized. 8.10 p.m.: A second pint, again containing 1 g. of pentothal, was begun. 10.45 p.m.: A third pint, containing 0.5 g. of pentothal, was begun.

Sept. 9.—1.30 a.m.: Drip discontinued; a total of 3 g. of pentothal had been given. He slept on for 3½ hours after the drip was stopped, remaining reasonably quiet until 8 a.m., when he again became violent; later he fell asleep for one and a half hours. 12.30 p.m.: The patient got out of bed, brushed all restraint aside, and ran into the corridor, where he collapsed exhausted. Sleep was again induced with 0.5 g. of pentothal, and the glucose-saline–pentothal drip reinstituted (1 g. to the pint as before). 3.20 p.m.: He was now kept under with 0.5 g. per pint, but this involved a faster rate of flow, and by 8 p.m., after having had 3 pints (1.7 litres) of fluid containing 2 g. of pentothal, signs associated with increased bronchial secretion became evident. Atropine 1/100 gr. (0.65 mg.) was administered. The concentration of the drip was then increased to 1.5 g. per pint, and a dripping-rate of 5 drops a minute sufficed to keep the patient narcotized.

Sept. 10.—By this time he had had 21 hours' continuous sleep (excluding the first occasion), with 4 g. of pentothal in 4 pints (2.3 litres) of glucose-saline. The drip was then discontinued. 12.15 p.m.: Beginning to waken. To prevent his regaining consciousness too quickly 6 dr. (21 ml.) of rectal paraldehyde was administered. 2.15 p.m.: Respirations becoming shallow and colour poor. Carbon dioxide and oxygen given in addition to strychnine 1/30 gr. (2 mg.). T. 103° F. (39.4° C.), P. 138, R. 32. 6–10 p.m.: Still unconscious. General condition very poor. One ampoule of nikethamide given hourly. T. 104.8° F. (40.45° C.), P. 150, R. 32. The patient was now beginning to be restless, but no effort at restraint was made.

Sept. 11.—4 a.m.: He was obviously beginning to regain consciousness. Those present in the room were his wife, a nurse, and the house-surgeon. He remained quiet and soon recognized these persons by their voices. He was apparently blind, but after three hours recovered sufficiently to recognize objects in the room. From this time he was very co-operative and began to take fluids by mouth. During the period of narcosis he was catheterized repeatedly, and he found some difficulty in passing urine during the next 12 hours. 10 a.m.: Complaining of severe abdominal pain. Morphine 1/2 gr. (32 mg.) and atropine 1/100 gr. were administered without effect. 12.15 p.m.: Pain continuing. Nepenthe 10 m. (0.6 ml.) and tincture of belladonna 10 m. given by mouth. Some nausea but no vomiting. 2 p.m.: Tincture of belladonna 10 m.; pain easier. This was repeated at 5 p.m. 11 p.m.: Patient unable to sleep; abdominal pain very severe. Morphine 1/2 gr. given; repeated at 1 a.m.

Sept. 12.—3 a.m.: Again very violent and "light-headed." Sleep was induced as before with 0.5 g. of pentothal; he slept for 3½ hours after this. On wakening the patient felt much better. The pain had subsided and his eyesight had recovered. He was very weak, and fell into a deep sleep. From then onwards he continued to improve rapidly. There was no internal or external haemorrhage, and the abdominal wound held firm except for two skin sutures.

It is interesting to note that he remembers nothing from the time when he went into theatre on Sept. 7 until he regained consciousness on Sept. 11. He does remember vaguely the vomiting of blood on the afternoon of the 8th.

Comment

With a history of previous post-operative violence, and in view of the recent psychological history, it was feared that the patient might behave as he had done before. The much greater degree of mental disturbance on this occasion may be due either to the greater weight of worry and misfortune or to the longer time he was under the anaesthetic. The exact

exciting factor is still in doubt, since further prolonged narcosis seemed to cure the condition.

It would appear that very dilute intravenous sodium pentothal can be administered over long periods, by means of a saline-drip apparatus, without undesirable after-effects. It is a matter for debate whether the pentothal (7.5 g. at intervals during 3½ days) was the cause of the apparent transient blindness, whether it was due to the cumulative effect of the drugs which were given, or whether it was of a hysterical nature.

I wish to express my thanks to Mr. Dalziel for permission to publish these notes; to Dr. Pinkerton (the anaesthetist); and to the visiting and resident staff for much valuable advice and assistance in the conduct of this case.

A. ROBERTSON KERR, M.B., Ch.B.,
House-surgeon, Western Infirmary, Glasgow.

Proteus vulgaris Septicaemia treated with Penicillin

Proteus infections of the blood stream are of uncommon occurrence; the report of a case successfully treated with penicillin may therefore prove of interest.

CASE REPORT

The patient, a diabetic woman aged 57, was admitted to King's College Hospital under the care of Dr. R. D. Lawrence for the treatment of varicose veins. The left internal saphenous vein was ligatured by Mr. A. J. Heriot on Oct. 17, 1945, and three days later 3 ml. of sodium morrhuate was injected. A small abscess developed over the site of the injection. This later discharged, and a pure growth of *P. vulgaris* was obtained from the pus on Oct. 25. The leg remained painful and swollen, and for the next three weeks there was an irregular type of fever between 98 and 101° F. (36.7 and 38.3° C.). During this period the patient was treated with 40 g. of sulphathiazole for eight days and an 18-day course of penicillin by 3-hourly intramuscular injections of 20,000 units, but without any improvement.

On Nov. 18 the patient became considerably worse, with a swinging temperature reaching 104° F. (40° C.) and with rigors. The blood was cultured on the same day, and *P. vulgaris* was grown in each of the bottles of glucose broth employed. The penicillin sensitivity of the organism originally isolated from the wound was not investigated, but the strain grown from the blood was inhibited by 3 units of penicillin per ml. (tube-titration method). A daily dose of 640,000 units of penicillin in 3-hourly injections was then started. Unfortunately no estimation of the amount of penicillin in the blood was made at this time, but as no clinical improvement occurred after six days the dose was increased on Nov. 27 to 1.76 million units daily. This was given in 2-hourly injections of 160,000 units each, omitting one dose in the night. The patient's general condition at once started to improve and the leg also became less swollen and painful. Her temperature began to fall steadily, reaching normal after nine days, and there was also a progressive fall in the total leucocyte count. Blood cultures taken on Nov. 28 and Dec. 3 were sterile. The large dose of 1.76 million units daily was maintained for 12 days, and examinations of the blood during this time showed that the penicillin content did not fall below 3 units per ml. There was no relapse when treatment was discontinued, and the patient made an uninterrupted recovery.

COMMENT

Organisms of the *Proteus* group are not infrequently associated with pathogenic lesions. They occur most commonly as secondary invaders in wounds and in infections of the urinary tract and of the ear, but they rarely invade the blood stream. When they do so the mortality rate is high, particularly in non-urinary infections. In a review of the literature dealing with such cases McKee (1944) found that septicaemia was most often associated with otitis media and mastoiditis, with cerebral abscess, lateral sinus thrombosis, and meningitis as common complications. Out of 23 reported cases of *Proteus* septicaemia following non-urinary infections only 5 recovered. Mackenzie and Hawthorne (1933) collected 17 cases of septicaemia following *Proteus* infection of the urinary tract and added one of their own; 5 of them proved fatal. Many of the cases gave a previous history of instrumentation or operation (Wallace and Dudgeon, 1915).

In the present case infection presumably occurred when the vein was injected, though this was done in the operating theatre with proper aseptic precautions and a fresh ampoule of sodium morrhuate was used. The chief point of interest, however, lies in the success which resulted when the dosage of penicillin was correlated with the bacteriological findings. In conclusion, it should be stated that to persevere with such frequent injections over a period of 12 days required no small fortitude on the part of the patient.

G. T. COOK, M.D.,
Asst. Clinical Pathologist, King's College Hospital.

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Reviews

RADIOGRAPHY OF GASTRO-INTESTINAL DISEASE

Roentgen Diagnosis of Diseases of the Gastrointestinal Tract. By John T. Farrell, jun., M.D. (Pp. 271; illustrated. $5.50 or 30s.) Springfield: Charles C. Thomas; London: Baillière, Tindall and Cox. 1946.

This book is based on lecture notes used by the author and distributed to his students in radiology at the Graduate School of Medicine of the University of Pennsylvania. It consists of concise descriptions of the radiological appearances associated with diseases of the gastro-intestinal tract and of the radiographic technique used, with 190 illustrative photographs. The subject-matter is arranged rigidly in accordance with the Standard Nomenclature of Disease, but the results of this attempt at precision are unfortunate. Closely related conditions, which would normally be discussed together, are thereby artificially separated, with inevitable duplication of description; for example, Colitis, Chronic; Sigmoiditis; Chronic Colitis due to Poison; Mucous Colitis; Ulcerative Colitis, Left-sided or Universal; and Ulcerative Colitis, Right-sided or Regional, all appear under separate headings on different pages, and many similar examples could be given. Much space is taken up with long lists of uncommon pathological conditions, which are either grouped together in the subsequent text or are not discussed at all; and the eye of the reader is constantly confused by rapidly alternating changes in the printing type used.

The book contains much useful information, but it is difficult to imagine what kind of reader the author had in mind when he decided to have these notes published in book form. Graduate students of radiology, wishing to revise this branch of the subject before an examination, might well find this manual helpful; practising radiologists, however, would find little that is not already available in the larger standard textbooks; while physicians, surgeons, or general practitioners, who might be expected to welcome a book of this kind, would be continually irritated by the defects in arrangement of the text to which allusion has already been made; they might read it with profit, but scarcely with pleasure.

GENITO-URINARY DISEASES

Synopsis of Genitourinary Diseases. By Austin I. Dodson, M.D. Fourth edition. (Pp. 313; illustrated. 18s.) London: Henry Kimpton.
Urological Nursing. By David M. Davis, M.D., Professor of Urology, Jefferson Medical College. Fourth edition. (Pp. 212; illustrated. 12s.) London and Philadelphia: W. B. Saunders Company.

In spite of the recent war genito-urinary surgery has advanced, and improvements in treatments have made necessary the appearance of a new edition of Dr. Dodson's well-known book. In it the uses and the limitations of the sulphonamides and of penicillin in the treatment of urinary infections are discussed. In Chapter XII attention is drawn to the value of castration and of oestrogen therapy in the palliative treatment of carcinoma of the prostate. The illustrations have been improved by substituting original pyelograms for the diagrams appearing in previous editions. As medicine advances, becomes more complicated, and divides itself into more and more special departments, synopses become of greater and greater value. Dr. Dodson's book will be of great service to those who because of the war have been unable to keep in touch with advances in urology and who now wish to revise their knowledge of this subject. It is perhaps unfortunate that the cost of such a useful handbook as this should be is as high as it is.

The nursing of a genito-urinary case is of the utmost importance; it would be no exaggeration to say that the after-treatment of a case of prostatectomy is as important as the operation itself. This being so, a urological primer written for nurses should be of great value. The fourth edition of Dr. Davis's book has been carefully revised so as to include such advances in medicine as the use of the sulphonamides and penicillin and the new method of treating carcinoma of the prostate by oestrogens and castration. The subject-matter falls naturally into two parts: the nursing care of urological cases, and the maintenance and the sterilization of urological equipment. These matters are clearly and simply described and the descriptions are supplemented by excellent illustrations. Dr. Davis's book can be recommended to all nurses who wish to revise their knowledge of this branch of their profession.

SURGICAL TREATMENT OF OSTEOARTHRITIS OF THE HIP

Traitement Chirurgical de l'Arthrite Sèche de la Hanche. Suivi de Travaux de la Clinique Orthopédique de la Faculté de Lyon. By L. Tavernier and Ch. Godinot. (Pp. 360; 103 figures. 150 francs.) Paris: Masson et Cie. 1945.

This book comprises a series of papers of wide scope by Prof. Tavernier and his associates at Lyons. In the first and largest section, dealing with osteoarthritis of the hip, an analysis is given of 100 cases treated by operation. The earlier cases were treated by arthrodesis. Later on emphasis has been upon arthroplasty. More recently still, various forms of sensory denervation have been carried out, and this, the authors consider, should be a routine procedure for the more distressing forms of osteoarthritis, no matter what else is done. Intra-articular operations have certain special indications: arthrodesis for unilateral cases. Arthroplasty, which should be "ideal," nevertheless is of dubious value because the results so frequently fall short of what one hopes for. Prof. Tavernier, however, advises it in bilateral cases, for, though no operation gives uniformly successful results, one procedure does not exclude the other if the first fails. The grossness of the disability caused by the disease and the inadequacy of medical treatment fully justify the surgical approach, in view of the enormous benefit that so often can be derived. Most British orthopaedic surgeons would fully support this view.

The second part of the book deals with osteoarthritis of other joints, and the third part comprises 14 papers reflecting the wide interests of the Lyons orthopaedic school.

INDIVIDUAL GYMNASTICS

Individual Gymnastics. A Handbook of Corrective and Remedial Gymnastics. By Lillian Curtis Drew. Fifth edition, revised and edited by Hazel L. Kinzley. (Pp. 253; illustrated. 15s.) London: Henry Kimpton. 1945.

It is now nearly a quarter of a century since the late Miss Lillian C. Drew first produced her book on *Individual Gymnastics*, and the present review concerns the fifth edition, revised by Miss Hazel L. Kinzley. This means that there has been over all these years a steady demand for instruction in this sphere of rehabilitation. The time has, however, passed for loose unscientific statements in any subject connected with medicine to be tolerated with the patience of twenty-five years ago. This is an age of science and of a deep appreciation of physics and physical facts in our daily life. Again, there are parts of this book that seem strangely out of tune with the lessons learned in the last war of the value of class games and exercises, as practised at the various rehabilitation centres such as Loughborough for the R.A.F. and Kingston for the Army. In this country passive movements in the treatment of fractures have been condemned for many years, so strongly that for a time physiotherapists were only allowed to handle orthopaedic cases provided passive movements were never employed, but on page 117 "passive movements to restore the normal range of movement . . . are of great assistance" in fractures.

About a quarter of the book is taken up with a number of exercises well illustrated and carefully defined. Each exercise is annotated under the subdivisions "starting position," "movement," "variation," "comment," and "value." It is unfortunate that in neither preface, foreword, nor the opening chapters is any indication given of the audience for whom the book is written. It would be far too elementary for the fully trained physical training instructor or qualified gymnast in this country; it would, equally, be of little real value to medical practitioners or student physiotherapists. Hence it is difficult to conceive the group which would find real value in a book that has had so much care and time spent on its revision.

Notes on Books

We wonder into whose pocket the second edition of *A Pocket Surgery*, by PHILIP H. MITCHINER and A. HEDLEY WHYTE, will find its way. The terse phrasing and direction as to the outstanding points in diagnosis and treatment may during the war years have been valuable to the general service medical officer, called to do duty on the surgical side of a hospital or elsewhere and whose tunic pocket the book probably filled. It may be supposed that it will now slip into the pocket of the pre-examination student, but woe betide him if he is not well versed in the surgical practice of his hospital, because brevity has here reached dangerous lengths. For example, chronic appendicitis, he is told (p. 219), produces tiredness, weakness, indigestion, and epigastric pain chiefly, but in no way definitely related to meals . . . "all symptoms completely clear up when the appendix is removed." It is to be hoped that those who buy this little volume will not keep it too frequently in pockets from which absorption is slow, because there is in it much worthy of assimilation. The publishers are J. and A. Churchill, and the price is 8s. 6d.

Several recent incidents have focused public attention on the punishment of troublesome boys and young men in Borstal establishments and in civil and military prisons. In *Eliminating Punishment* (Psychological and Social Series, 10, Nottingham Place, London, W.1; 1s.) Mr. W. DAVID WILLS makes out a convincing case for doing away with punishment altogether in reformative treatment of this class of citizen. He writes from long practical experience, especially at Hawkspur Camp and Barns House, two hostels started by the Society of Friends during the war which received lads and men of very varied and difficult types. He maintains that discipline as commonly understood has no value in the training of character, that the discipline that is necessary for the administration of a community can be achieved without punishment, and that punishment is unconditionally wrong because it defeats the aim of character training. How these difficult young males can be turned into useful and creative members of a community and of society by making them share the responsibility for its life, and how the search for ways to defy authority which obsesses so many of them can be diverted into a more useful channel, make a fascinating story, which is illustrated by extracts from many records.

Principles of Internal Medicine: A Course for Nurses, by Dr. D. M. BALTZAN (Toronto: The Ryerson Press), is available in London from Hatchards, Ltd., at 25s. This book illustrates a tendency which we frankly regard with apprehension; that is, that there shall be an approximation of a nurse's training to that of a medical student. Many syllabuses of the nurse's curriculum illustrate this tendency. The result is either a façade of unassimilated knowledge or a diversion of the nurse's attention from nursing. The author has produced an elaborate book, full of information; but in the first chapter he devotes a section to the principles of diagnosis, which, we submit, does not come into the nurse's province. Yet we have failed to find any information about what a nurse should observe and report to the doctor, or any guidance in, what is surely fundamental, the care and comfort of the patient. Dr. Baltzan has lectured at various training schools for nurses, so that it is possible he has been the victim of a bad system. In any case, it is high time that a protest was raised against a system which evokes such a misconception of the proper training of a nurse.

More Thoughts and Comments of a Doctor, II–VII, by Dr. F. PARKES WEBER, is published by H. K. Lewis at 2s. 6d. The breadth and depth of Dr. Parkes Weber's learning, both in medicine and in archaeology, continue to surprise even his oldest friends. In this little collection of papers he ranges from the Sturge-Weber panathenaic amphora to contemporary forgeries of money. His own interest in these somewhat obscure topics carries the reader with him.

Preparations and Appliances

R.A.F. FLYING OVERALL

The R.A.F. "flying overall," which saved the lives of many men suddenly precipitated into the cold sea, is described by Squadron Leader E. A. Pask, M.B., in the May number of the *Maker-up* (the trade journal for clothing manufacturers, published from 110, Fleet Street, E.C.4). The overall, which is put on before flying, can be worn for any length of time because, although it is waterproof, perspiration escapes through the fabric. Its invention is the outcome of the combined efforts of the scientists of the R.A.F. Institute of Aviation Medicine and the Cotton Research Association, with the help of British spinners, weavers, and cloth processers. It is made of a special "Oxford weave" cloth with "tropal" interlining. A five-ounce (142 g.) interlining supports a 12-stone (76-kilo) man in water and retains its buoyancy almost indefinitely. It insulates the body against heat and cold, and so protected our bomber crews against extreme cold. Paradoxically it kept fighter pilots cool in the heat of the cockpit. The materials from which the R.A.F. flying overall is made will be available for civilian clothes and may revolutionize the manufacture of waterproof and other garments.

In order to cope with post-war difficulties in the production of surgical instruments and aseptic hospital furniture, Down Bros. and Mayer & Phelps have amalgamated. The personal managements remain as heretofore.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JUNE 22 1946

CHEMISTRY AND MEDICINE

The relationship of chemistry to medicine has been discussed often and from many standpoints. Historically, the association of these two branches of knowledge has passed through great vicissitudes. At the one extreme we have the school of the iatro-chemists of Leyden in the seventeenth century, who founded their whole philosophy of medicine upon chemistry; at the other, we have the attitude of scepticism and even resentment of chemists, which seems to have grown up on the part of physicians in parallel with the great advances of clinical medicine during the nineteenth century. Now we have reached a stage at which sympathy and co-operation between chemists and medical men have again become closer, and at which few of the latter would belittle the debt their profession owes to chemical science. There can be no question that the continuance and increase in the activity of the interaction between chemistry and medicine will be to the benefit of both; if this is to be achieved, however, it is necessary that more than lip service should be paid to the principle by the members of both professions. The chemist must look upon medical problems as offering a field for the fullest possible development of his own science, and the medical man must learn to see in chemistry more than a source of new drugs and new laboratory techniques. How far can we say that these requirements are now being fulfilled?

It is probable that the neglectful attitude of medicine to chemistry during the last century was first altered by the discovery of the internal secretions, rapidly followed by that of the vitamins. When we add to these achievements of physiology and chemistry the accession of strength to therapeutics which has come with the evolution of chemotherapy there would seem to be little fear that the capacity of chemistry to help medicine would ever again be doubted. Moreover, it must be remembered that these achievements not only were services to medicine but represented advances in chemistry itself; they could not have been made but for the previous accumulation of chemical knowledge, and to the further increase of such knowledge they themselves contributed. An excellent example of this interplay of forces is afforded by the story of the chemistry of penicillin, referred to by the President of the Royal Society in the address on the occasion of the bicentenary celebrations of the Middlesex Hospital, which is printed elsewhere in this issue. The isolation in the pure form of a natural product having the peculiar properties and chemical instability characteristic of penicillin and the later massive industrial production of this substance are triumphs of the application of the principles of chemistry and the technique of chemical engineering to a microbiological problem. In the successful unravelling of the chemical constitution of penicillin we see the methods of classical organic chemistry at work, with essential support from physics in the form of *x*-ray crystallography. On the other hand, the failure up to date to achieve a practicable synthesis of penicillin, in spite of the resources of chemical talent which have been brought to bear on the problem, reveals the incompleteness of organic chemical knowledge which Sir Robert Robinson is at pains to point out. It is not to be supposed that the attack on the problem of the synthesis of penicillin will be abandoned, and it is more than likely that success, when it comes, will bring in its train important new accessions to the science of organic chemistry. Here, then, is a case where chemistry has been able to help medicine by bringing a microbiological discovery into the practical service of therapeutics, and where the very failure of the chemists to solve the complete problem will stimulate them to make further efforts to develop their own science.

There are, however, less obvious ways than the synthesis of a new therapeutic agent or even the elucidation of the chemistry of a hormone or vitamin in which chemistry may help the development of medicine, and to these Sir Robert Robinson rightly calls attention. These ways are less obvious because they concern the fundamental chemistry of proteins and of the cell—questions which may seem as remote from practical medicine as did the researches of the nuclear physicists from the reality of Hiroshima. With the recent history of atomic research in mind, he would be a bold man who would question the practical potentialities of the most academic biochemical research; the exploration of the structural chemistry of proteins in general and the particular study of nucleoproteins are growing points in chemical investigation from which may be expected advances having not only a profound effect on biological thought but practical results in medicine itself.

The account which Sir Robert Robinson has given of the past contributions of organic chemistry to medicine is sufficient to show that there is no unwillingness on the part of the chemist to choose the field offered by medical problems for the pursuit of his own branch of science. A chemist who makes this choice can, by diligence in study and by cultivating scientific contacts with biologists and medical men, go some way towards achieving a real understanding of the biological aspects of the problem he is studying. If he is to play his part to the best effect, however, he must be met by genuine collaboration from the medical side, and this can be given only if the medical man will make a corresponding effort to understand the background and mode of thought of the chemist sufficiently to appreciate both the ways in which he can help and his limitations. Appreciation of the potential usefulness of chemistry to medicine is not enough; nor is it enough for the medical man to pose problems to the chemist and to trust to the technique of the latter to do the rest. Rather is there needed sympathetic and understanding discussion in which problems not only are posed but are so far analysed that the chemist is placed in the best position to plan a feasible attack on the essential points. It is clear that fruitful discussion of this sort cannot take place unless the medical man has a real and

understanding appreciation of the past achievements and the potentialities of chemistry in its application to biology. Such appreciation can come only from the instruction in chemistry and biochemistry which is given to medical students, and Sir Robert Robinson has done a useful service in calling attention once more to the great need for improvements in this respect. So long as the medical student, as is now often the case, can complete his course with little appreciation of chemistry as a science, and having acquired perhaps an active distaste for it as a technique, he will be quite unable later on to collaborate with a chemist to the mutual advancement of chemistry and medicine. He may, as a doctor, value the practical results of the chemist's work and he may even admire his scientific ability, but he will be incapable of joining with him in intellectual effort directed to a common end. If the ultimate solution of this educational problem is far from clear, it is certain that a considerable advance would be made if more medical men were able to find a vocation in research and teaching in the chemical aspects of their subject. At present such men are all too rare. An increase in their number would do much to bridge the remaining gap between chemists and biologists, not only by virtue of their own work but through the influence they would exercise on the medical students who passed through their hands.

"MALIGNANT MALNUTRITION"

During the years between the two world wars the science of nutrition developed rapidly. A wealth of new knowledge was gathered, and it seemed probable that the main facts concerning the food principles necessary for sound nutrition, and the ill effects of their omission, had already been elucidated. Thus scurvy resulted from deficiency of vitamin C, xerophthalmia and night blindness from deficiency of vitamin A, hunger oedema from deficiency of protein, and so on. To some workers it appeared that the days of important new discoveries were over, and that future developments would lie in the application of existing knowledge to practical medicine and dietetics.

Theoretical progress has certainly been impressive; no one will deny the urgent need for its full practical application. But in the Tropics and in war-stricken European countries field workers have demonstrated repeatedly that the clinical picture shown by malnourished or starved populations may often differ widely from textbook descriptions. As Stannus[1] has pointed out, unknown or ill-defined deficiency diseases probably far outnumber those whose characteristics are already plainly established. The condition of "malignant malnutrition" recently studied in Uganda by Trowell and Muwazi[2] presents problems which expose the limitations of existing knowledge. The first adequate description of this disease was given in 1933 by Cicely Williams,[3] who used to describe it by the native name of "kwashiorkor," meaning a red boy or man. Although a reddish pallor of the skin and a softening and browning of the hair are frequently seen in affected native children, the change of colour in adults may be much less noticeable. Other features of the syndrome are loss of weight or failure to grow, oedema, an abnormal albumin–globulin ratio, crazy-pavement dermatosis, macrocytic anaemia, slight mental and neurological changes, and a deficiency bowel pattern, as indicated in the *x*-ray film. Although food passes through the intestines at a normal rate much undigested material is present in the faeces. The stools are loose, and in children there is steatorrhoea. The complete picture, however, is not always shown. The bowels may not be loose, and in children there may be no crazy-pavement dermatosis. In adults there is sometimes moderate osteoporosis. In specimens of liver taken by biopsy Gillman and Gillman[4] in 1944 found fatty degeneration, which was sometimes preceded by pigment cirrhosis.

An examination of native diets indicated that very poor labourers subsist on inadequate amounts of cassava, which is deficient in most nutrients except vitamin C. Other labourers, who come from Belgian mandated territory to seek work in Uganda, live mainly on sweet potatoes, with a very little meat and green vegetables. Ganda peasants and their children have a slightly more varied diet, with plantains, potatoes, green vegetables, ground nuts, sugar, and a little meat. Even this diet, however, was calculated to be deficient to some extent in protein, calcium, and nicotinic acid, and to a less extent in aneurin, riboflavin, and vitamin A. To complicate the appraisal of the effects of malnutrition many of the natives suffered from malaria, hookworm disease, syphilis, and various protozoal infections. "Malignant malnutrition" is often fatal, and the response to dietary treatment slow and uncertain. The presence of dermatitis might suggest that a form of pellagra is involved, but while treatment with nicotinic acid amide caused a peeling of the dermatosis a glazed and reticulated surface remained which showed no further improvement. Similarly, treatment with aneurin improved the appetite and increased the sense of well-being, but had no effect on the oedema. Liver concentrates and ferrous sulphate were beneficial to those suffering from macrocytic anaemia. Satisfactory cure of the syndrome as a whole, however, was effected only by the combined action of an improved basal diet and supplements of liver, milk, aneurin, and nicotinic acid.

Further research may reveal the lack of some single factor which is mainly responsible for "malignant malnutrition." In view of the high incidence of macrocytic anaemia, the recent work of Spies[5] suggests that folic acid therapy is at least worth a trial. On the whole, however, it seems most probable that several deficiencies are involved, and that pathological changes are caused in the tissues which are not easily corrected even when the missing nutrients are restored. We are therefore faced with the possibility that a nutritional deficiency disease, with fairly well defined lesions, may be due not to a single dietary defect but to multiple deficiencies. If this is so the ingenuity of the clinician will be taxed in applying the lessons learnt in the experimental study of nutrition to his work in the field.

[1] *British Medical Journal*, 1946, **1**, 620.
[2] *Trans. roy. Soc. trop. Med. Hyg.*, 1945, **39**, 229.
[3] *Arch. Dis. Childh.*, 1933, **8**, 423.
[4] *Nature*, 1944, **154**, 210.
[5] *Lancet*, 1946, **1**, 225.

EXPERIMENTAL PEPTIC ULCERATION AND GASTRECTOMY

The importance of gastric hyperchlorhydria in the genesis of peptic ulcer in man has long been recognized, but attempts to produce peptic ulceration in the experimental animal by the repeated injection of histamine in aqueous solution have not been successful. Orndorff, Bergh, and Ny[1] obtained only infrequent superficial duodenal erosions, and no persistent or deep ulcers, by injecting dogs with 2 mg. of histamine in water, two-hourly, ten times a day, for 66 days. Code and Varco,[2] however, giving daily subcutaneous injections of 30 mg. of histamine in a beeswax base produced peptic ulceration regularly in dogs. Owen Wangensteen,[3] in the seventh Listerian oration at Montreal, has now recorded the details of an extensive study of this form of experimental peptic ulcer in ten species of animals. Nearly all the dogs, cats, chickens, ducks, and swine so injected developed gastro-duodenal ulceration, and the incidence in guinea-pigs, woodchucks, and calves seemed to be almost as high; the monkey and the rabbit were partially resistant. In most of these species the ulcers developed in the antrum, or first part of the duodenum, though in the chicken and in the duck they were located in the gizzard, and in the pig in the squamous epithelium of the upper part of the stomach.

The main surgical interest of this experimental method lies in the fact that if susceptible animals are subjected to gastrectomy and after operation to a course of injections of histamine in beeswax a certain number develop ulceration of the jejunum. Wangensteen reasonably assumes that this offers a yardstick for the efficacy of any given technique of gastrectomy. Most convincing is his comparison of short-loop and long-loop reconstitution after gastrectomy. The incidence of stomal ulcer increased significantly with the distance of the stoma below the ligament of Treitz. A long afferent loop of jejunum facilitated the development of jejunal ulcer. The most satisfactory form of gastrectomy appeared to be a resection of a portion of the stomach equivalent to 75% of its total weight and including antral mucosa and lesser curvature (after Hofmeister), with reconstitution by a retrocolic anastomosis placed at or proximal to the level of the ligament of Treitz. The Billroth I procedure of reconstitution by end-to-end gastro-duodenostomy and its von Haberer modification (end-to-side gastro-duodenostomy) showed no advantage over the Billroth II operation.

Wangensteen is satisfied that it is wise to apply these conclusions to the surgical treatment of peptic ulcer in man. In 400 consecutive gastrectomies for ulcer he has performed a 75% resection with removal of lesser curvature and antrum and reconstitution by a retrocolic anastomosis at or just proximal to the level of the ligament of Treitz. All these patients have been carefully followed; only one has so far developed a stomal ulcer, and he had undergone gastrectomy for jejunal ulcer consequent upon a previous gastro-jejunostomy. Wangensteen now believes the gastrectomy in this case to have been too limited in extent—only 155 g. of stomach was removed instead of the usual 185 g. or more—and a further 86 g. was removed at a subsequent operation. Wangensteen does not say how long a period has elapsed since these gastrectomies were performed, but his experimental support for a posterior no-loop anastomosis in gastrectomy is weighty, and the histamine–beeswax technique for producing not only gastro-duodenal but also post-operative jejunal ulceration may open a new chapter in the experimental surgery and therapeutics of peptic ulceration.

[1] *Surg. Gynec. Obstet.*, 1935, **61**, 162.
[2] *Proc. Soc. exp. Biol.*, N.Y., 1940, **44**, 475.
[3] *Canad. med. Ass. J.*, 1945, **53**, 309.

ISOTOPES IN THE STUDY OF PERIPHERAL VASCULAR DISEASE

Atoms of a radioactive isotope of any element are chemically indistinguishable and inseparable from atoms of its normal stable isotope. Likewise, when either normal or radioactive isotopes are given to any animal or human being the effect is identical unless the dose is large enough to produce damage because of its radioactivity. Each radioactive atom, however, in disintegrating emits either beta or gamma rays, or both, and these may be detected in various ways. Any substance can thus be "tagged" by mixing with stable atoms a very small number of radioactive ones, and in this way the passage of the substance through the body can be traced. The site of storage can be discovered as well as the form in which it is excreted, and the rate of excretion. Isotopes will undoubtedly have much to contribute to the study of metabolism, and though this may be their major field of usefulness it is important to take note of the other fields in which they have been used so that these may be fully developed. The Medical Research Council is considering methods of making isotopes available to workers in this country.

Radioactive sodium—Na^{24}—is prepared in a cyclotron by bombarding sodium metaborate with deuterons. Recently Smith and Quimby[1] have reported its use as a tracer in the study of peripheral vascular disease in more than 200 cases. A few millimetres of normal saline "tagged" with Na^{24} were injected into the antecubital vein. The usual dose of the isotope was about 100 microcuries in 5 to 12 ml. of solution; the dose of radiation for each test is thus considerably less than one roentgen, and therefore it is possible to repeat the test at reasonable intervals. Its arrival in the foot was noted by the use of a Geiger-Müller counter. In this way the circulation time, arm to foot, was accurately measured. The average in 131 cases was found to be 39 seconds, with a range of 15 to 105 seconds; but most of the cases had some form of peripheral vascular disease. It is surprising that in the 11 normal cases the average time was 43 seconds, though the range was only 20 to 55 seconds. The longest time—105 seconds—was in an elderly arteriosclerotic, and the shortest—15 seconds—occurred in a young man, with a pulse of 100, suffering from sclerodermia.

The arrival of the radioactive substance in the tissues in contact with the counter is evident from the steep increase in the counting rate. In normal subjects, and in many with vascular disease, the increase is sudden and well defined, but in those with a poor circulation it is so gradual that it is difficult to be certain of the exact time of arrival, and for this reason five-second counts were recorded. The counter was also left in position and counting was carried on minute by minute, since it was found that the count increased steadily until equilibrium was established between the radioactive sodium in the plasma and extravascular fluid in about 45 minutes. It was further found that all readings in normal subjects fell within a characteristic "build-up" curve, whereas those with pathological conditions fell outside the curve. These curves were much below the normal range in such conditions as Raynaud's disease, sclerodermia, frost-bite, immersion foot, and thrombo-angiitis obliterans; while in erythromelalgia they were found to be substantially above the normal range.

The curves proved of special value in deciding whether conservative or radical surgery was the best treatment in conditions such as diabetic gangrene of foot. If the build-up curve was within the normal range local amputation proved to be successful and healing of the wound by first

[1] *Radiology*, 1945, **45**, 347.

intention occurred; on the other hand, if the build-up curve was below normal healing would probably not occur and more radical surgery was necessary. Counts were also taken in these cases at other positions, such as the calf, popliteal region, and the thigh, and comparisons were made between counts made at the same level in the two legs, so that the extent of the disease process might be established. These counts proved particularly useful in determining the site of amputation at which healing might be expected, and often confirmed the present clinical tendency of thinking that in many cases of gangrene needing amputation the knee-joint can be saved.

RACIAL DIFFERENCES IN MORTALITY

The mortality experience of a country is a fair index of its economic and hygienic conditions. Perhaps the best-known specific cause of death that can be correlated with social conditions is tuberculosis. International comparisons show that tuberculosis decreases in importance with increasing industrialization, but within any country industrial areas have a larger death rate than rural districts. It has often been suggested that differences in death rates between countries may be due partly to some racial trait. Widely varying living conditions make it almost impossible to separate environmental and racial causes of differences in mortality. But the large groups of alien origin sharing much the same environment in the United States of America supply data for the study of this problem.

Dublin and Baker,[1] analysing the records of New York and Pennsylvania for 1910, showed that the death rates for the foreign-born population were higher than those for the natives. This classic study was based on 20-year age groups. A similar study covering New York State and New York City has been made recently by Calabresi.[2] The data used were the deaths for the five years 1928–32 and the census of 1930; the rates were standardized in five-year age groups by the indirect method employed by the Registrar-General of England and Wales. Standardized death rates for New York State over the period studied were 11.8 for native-born males and 10.2 for females, as against 12.9 and 11.4 for foreign-born males and females. Italians had the lowest rates—10.4 for males and 10.7 for females. For people born in England, Scotland, and Wales the corresponding figures were 11.5 and 10.7. Germans (12.6 and 11.0) and Canadians (12.9 and 11.7) had a mortality in excess of the native-born. Russians and Poles had a high mortality, but the Irish had the worst experience with rates of 16.5 and 15.0, which was 40% above that of the native-born population. An examination of the specific causes of death showed that Italians had a high rate for pneumonia; Germans had a low rate for tuberculosis and pneumonia; Canadians had a low rate for tuberculosis. There were also some interesting contrasts between the sexes. Heart diseases and diabetes were more frequent among Italian females than males; British females had an unusually high incidence of cancer; nephritis and diabetes were relatively higher in the native-born females than among males.

The large alien-born element in America must have an important influence on the size of the American death rate. The proportion of the population of Irish origin (Irish Free State) was estimated to be 11.2 of the total population in 1920. The unfavourable death rates of the foreign-born may be due to the persistence of old habits and traditions, which may greatly influence personal hygiene and the general standard of living. However, it does not seem likely that this is an important factor because the Canadians had an adverse experience. Though mainly of British stock, they had a mortality considerably above the extremely favourable rate shown by the British. A comparison of the mortality of the foreign-born American with that of the country of his origin is not likely to show whether mortality is improved or not by residence in the United States, since the immigrants cannot be taken as representative of their native country. A further study, based on the mortality of the descendants of the foreign-born population, would be necessary before any conclusion could be reached on the vitality of the different races.

[1] *J. Amer. statis. Ass.*, 1920, **17**, 13.
[2] *Human Biology*, 1945, **17**, 340.

MEDICAL PHOTOGRAPHY

A Medical Photographers' Group has now been constituted within the Royal Photographic Society. At its inaugural meeting Surg. Rear-Admiral C. P. G. Wakeley remarked that the medical profession has hitherto had to rely largely for its records upon free-hand artists, and some excellent work has been done, but such service is often not available, and increasing resort has to be made to photography, alike in the operation theatre, the ward, the out-patient department, and the post-mortem room. Given the right technique, no more accurate method exists. Admiral Wakeley spoke of the value of records made before and after treatment, operative or other, and insisted on the need for such pairs of photographs to be on the same scale and to be made so far as possible according to the same procedure. A number of speakers, including photographers attached to large hospitals and free-lance medical photographers, gave an account of their experiences, which suggested that photography now has an importance in many departments which calls for a highly trained expert. Dr. Richardson Billings described a method he has worked out for photography in the operating theatre. A usual method is to have a long-focus lens in the camera and lights fixed above the table, well out of the field of surgical activity. Dr. Billings has employed a different method. From his heavy-based tripod rises a perpendicular standard supporting a baseboard so arranged as to give universal movement and to carry the camera and lamps. The illumination comes from photoflood apparatus mounted in chosen positions around a form of lens hood, with a central incandescent lamp for focusing. The novel feature, however, is a mirror—or it may be a prism—set at an angle of 45° to the optical axis of the camera, the principle being the same as that of the laryngoscope and giving a "surgeon's-eye view" of the field of operation. It is claimed that this eliminates the distortion and foreshortening inevitable with a camera at any other angle or distance. The arrangement also fulfils two necessary conditions: that the photographer and his apparatus must keep out of the way of the surgeon, and that the apparatus must need the bare minimum of preparation. Among experiences related by photographers was the obtaining of a rapid sequence of films to illustrate the delivery of twins by Caesarean section—a task requiring unexpected mobility on the part of the photographer and his apparatus.

THE HALF-YEARLY INDEXES

The half-yearly indexes to Vol. II of the *Journal* and the *Supplement* for 1945 have been printed. They will, however, not be issued with all copies of the *Journal* but only to those readers who ask for them. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Accountant, B.M.A. House, Tavistock Square, London, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

BIRTHDAY HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in *Supplements* to the *London Gazette* on June 13.

Barony

Sir AMBROSE EDGAR WOODALL, M.D., M.Sc., F.R.C.S. Senior Surgeon, Manor House Hospital, Golders Green. For political and public services.

K.C.S.I.

Major-General (local Lieutenant-General) GORDON WILSON, C.B., C.B.E., *M.C.*, M.B., Ch.B., late R.A.M.C. Honorary Surgeon to the King. Director, Medical Services in India.

K.C.M.G.

PETER HENRY BUCK, D.S.O., M.D., D.Sc. Director of Bernice P. Bishop Museum, Honolulu, and Professor of Anthropology, Yale University. For services to science and literature.

K.B.E. (Military Division)

Major-General ALEXANDER GORDON BIGGAM, C.B., O.B.E., M.D., F.R.C.P., late R.A.M.C. Honorary Physician to the King.

Brigadier (Local) HUGH WILLIAM BELL CAIRNS, F.R.C.S., R.A.M.C.

Acting Air Vice-Marshal JOHN JOSIAS CONYBEARE, *M.C.*, M.D., F.R.C.P., R.A.F.V.R.

Air Marshal ANDREW GRANT, C.B., C.B.E., M.B., Ch.B., R.A.F.

Temporary Surgeon Rear-Admiral CECIL PEMBREY GREY WAKELEY, C.B., D.Sc., F.R.C.S., F.A.C.S., F.R.A.C.S.

K.B.E. (Civil Division)

HARRY CHAPMAN SINDERSON, C.M.G., M.V.O., O.B.E., M.D., F.R.C.P.Ed. Dean of the Royal Faculty of Medicine, Baghdad.

Knighthood

Major-General GORDON COVELL, C.I.E., M.D., I.M.S. Honorary Physician to the King. Director, Malaria Institute of India, Delhi.

ANDREW DAVIDSON, M.D.Glasg., F.R.C.S.Ed., D.P.H. Honorary Physician to the King. Chief Medical Officer, Department of Health for Scotland.

PHILIP NOEL PANTON, M.B., B.Ch. Consultant Adviser in Pathology, Ministry of Health.

LEONARD GREGORY PARSONS, M.D., F.R.C.P., F.R.C.O.G. Professor of Diseases of Children, and Dean of the Faculty of Medicine, University of Birmingham.

C.B. (Military Division)

Major-General NEIL CANTLIE, *M.C.*, M.B., Ch.B., F.R.C.S., late R.A.M.C. Honorary Physician to the King.

Surgeon Vice-Admiral HENRY ST. CLAIR COLSON, C.B.E., M.B., B.S., D.P.H., R.N.

Major-General (Temp.) JOHN CECIL ALEXANDER DOWSE, C.B.E., *M.C.*, M.B., B.Ch., late R.A.M.C.

Major-General DAVID VINCENT O'MALLEY, O.B.E., M.B., B.Ch., I.M.S. Honorary Surgeon to the Viceroy of India.

Air Vice-Marshal ARTHUR EDWARD PANTER, M.R.C.S., L.R.C.P., R.A.F. Honorary Surgeon to the King.

C.S.I.

Major-General JOHN PATRICK HUBAN, O.B.E., M.B., B.Ch., I.M.S. Honorary Surgeon to the King. Surgeon-General with the Government of Madras.

C.I.E.

Col. NORMAN BRIGGS, M.R.C.S., L.R.C.P., I.M.S. Inspector-General of Civil Hospitals, United Provinces.

Lieut.-Col. GURDIAL SINGH GILL, O.B.E., M.B., Ch.B., I.M.S. Inspector-General of Prisons, Madras.

Lieut.-Col. (Temporary Col.) DAYA RAM THAPAR, O.B.E., M.B., Ch.B., I.M.S./I.A.M.C. Commandant, I.A.M.C., Headquarters, Poona.

C.B.E. (Military Division)

Acting Air Commodore EDWARD DEMETRIUS DALZIEL DICKSON, M.B., Ch.B., F.R.C.S.Ed., R.A.F.

Surgeon Rear-Admiral CYRIL VERITY GRIFFITHS, C.B., D.S.O., M.R.C.S., L.R.C.P. Honorary Physician to the King.

Air Commodore PHILIP CLERMONTE LIVINGSTON, O.B.E., A.F.C., F.R.C.S., R.A.F.

Brigadier (Local) JOHN RAWLINGS REES, M.D., F.R.C.P., R.A.M.C.

Col. OSWALD LYALL SHEARER, L.R.C.P.&S.Ed., S.A.M.C.

C.B.E. (Civil Division)

LEONARD WYNNE EVANS, M.R.C.S., L.R.C.P., Colonial Medical Service. Chief Medical Officer, Penang, Malaya. For services prior to and during the Japanese occupation.

JAMES FERGUSON, M.B., Ch.B., D.P.H. Lately County Medical Officer of Health, Surrey.

WILLIAM KELSEY FRY, *M.C.*, M.R.C.S., L.R.C.P., L.D.S. Dental Surgeon, Guy's Hospital.

Lieut.-Col. HILDA MARY LAZARUS, F.R.C.S.Ed. Chief Medical Officer, Women's Medical Service, and Assistant Director-General, I.M.S. (Women's Branch).

OSBORNE HENRY MAVOR, M.D., F.R.F.P.S. Playwright ("James Bridie"). Chairman, Scottish Committee of the Arts Council.

TOM LAKIN PAGET, M.R.C.S., L.R.C.P. Formerly Director of Maternal Welfare, Health Department, New Zealand.

HENRY RICHARD RISHWORTH, O.B.E., F.R.C.S. Principal Medical and Health Officer, Great Indian Peninsula Railway, Bombay.

DOUGLAS JAMES VALENTINE, *M.C.*, M.B., B.S., Colonial Medical Service. Lately Deputy Director of Medical Services, Hong Kong. For services during internment.

O.B.E. (Military Division)

Acting Wing Cmdr. FENTON BRAITHWAITE, F.R.C.S., R.A.F.V.R.

Col. (Temp.) GEOFFREY WILLIAM STANLEY FOSTER, M.R.C.S., L.R.C.P., R.A.M.C.

Lieut.-Col. HARRY KARL GROFF, V.D., M.D., R.C.A.M.C.

Col. HAROLD PARRISH HAMILTON, M.D., R.C.A.M.C.

Lieut.-Col. (Temp.) CHARLES HENRY HOSKYN, M.B., B.Chir., R.A.M.C.

Lieut.-Col. (Temp.) NOWSHIR JUNGALWALLA, M.B., B.S., I.A.M.C.

Acting Surg. Capt. GEORGE MCCOULL, V.D., M.D., R.N.V.R.

Col. ROY HOSMER MCGIBBON, R.C.A.M.C.

Lieut-Col. JAMES CHARTERIS PATERSON, M.C.P.&S., R.C.A.M.C.

Surg. Cmdr. ARNOLD PERRY, V.D., F.R.C.S.Ed., R.N.Z.N.V.R.

Acting Group Capt. PATRICK BRUNTON LEE POTTER, M.D., R.A.F.

Col. (Temp.) RONALD WILLIAM RAVEN, F.R.C.S., R.A.M.C.

Lieut.-Col. (Temp.) ARCHIBALD MAXWELL ROBERTSON, M.B., Ch.B., R.A.M.C.

Surg. Cmdr. EDWARD GWYNNE THOMAS, V.D., M.D., R.N.V.R.

Temp. Acting Surg. Lieut.-Cmdr. DAVID ALEXANDER THOMSON, M.B., Ch.B., R.N.V.R.

Col. (Acting) LABAN EDWIN VINE, M.B., B.S., F.R.C.S.Ed., R.A.M.C., Malayan Medical Service.

Surg Cmdr. WILFRED KEITH WELSH, M.C.P.&S., R.C.N.(R.).

O.B.E. (Civil Division)

RATNAM APARAJOO, L.M.S.S.A. For service as surgeon, Penang, during the Japanese occupation.

LAI PO CHUEN, M.B., B.S. Lately Medical Officer, Medical Department, Hong Kong. For services during the Japanese occupation.

KENNETH HENRY DYKE, M.B., Ch.B. Director of Medical Services, Basutoland.

HAROLD FAIRBAIRN, M.D., Colonial Medical Service. Sleeping Sickness Officer, Tanganyika Territory.

TSE JEN HUA. Medical Officer, Medical Department, Hong Kong. For services during the Japanese occupation.

Capt. ARTHUR DURNFORD ILIFF, M.R.C.S., L.R.C.P., I.M.S. Agency Surgeon, South Waziristan, North-West Frontier Province.

Major MUHAMMAD JAFAR, M.B., B.S., I.M.S. Director of Public Health, Bengal.

BURJOR FRAMJI KHAMBATTA, M.B.E., M.B., B.S. Port Health Officer, Karachi.

MARJORIE JEAN LYON, M.B., B.S., F.R.C.S.Ed., Colonial Medical Service. Medical Officer, Malaya. For services during evacuation and internment.

GOPAL DASS MADHOK, L.R.C.P.&S.Ed., Cachar, Assam.

Major JAMES DUNCAN MURDOCH, M.B., Ch.B.N.Z., F.R.C.S.Ed., I.M.S. Professor of Obstetrics and Gynaecology, Prince of Wales Medical College, Patna, Bihar.

ISAAC LADIPO OLUWOLE, M.B., Ch.B. Medical Officer of Health, Lagos Town Council, Nigeria.

Rao Bahadur KIZHAKKE COVILAGAM KUTTY ETTAN RAJA, L.R.C.P.&S.Ed. Secretary, Health Survey and Development Committee, and lately Assistant Public Health Commissioner with the Government of India.

WALTER SNEDDON ROBERTSON, M.B., Ch.B. Orthopaedic Surgeon, Wellington Public Hospital, New Zealand.

JAMES PATRICK TAYLOR, M.B., Ch.M. Principal Medical Officer, British North Borneo (Chartered) Company. For services during the Japanese occupation.

ROBERT SCOTT TAYLOR, M.B., Ch.B. Medical Officer of Health, Zanzibar.

GAR HSI THOMAS, M.B.E., M.D. Medical Officer, Medical Department, Hong Kong. For services during enemy occupation.

Major GEOFFREY BENION THOMAS, M.Sc., M.B., Ch.B.Sheff., F.R.C.S.Ed., I.M.S. Superintendent, Government Hospital for Women and Children, and Professor of Midwifery, Madras Medical College.

ARTHUR STEWART WESTMORLAND, M.R.C.S., L.R.C.P., Colonial Medical Service. Senior Medical Officer, Kingston Public Hospital, Jamaica.

ALFRED ERNEST YOUNG, M.R.C.S., L.R.C.P. Medical Officer, Basutoland.

M.B.E. (Military Division)

Major (Temp.) IAN ALFRED ANDERSON, M.B., Ch.B., R.A.M.C.
Capt. RAFFAELLO WILLIAM BIAGI, M.B., Ch.B., R.A.M.C.
Temporary Surg. Lieut. ALASTAIR KINGSLEY BROWN, M.B., Ch.B., R.N.V.R.
Major (Temp.) DAVID LLOYD GRIFFITHS, M.B., Ch.B., F.R.C.S., R.A.M.C.
Capt. (Temp.) MOTI LAL, I.A.M.C.
Major GUY LATOUR, R.C.A.M.C.
Major (Temp.) DESMOND GRAHAM MCCONNELL, M.B., Ch.B., R.A.M.C.
Major ANGUS RUSSELL MCPHERSON, R.C.A.M.C.
Major WILLIAM HENDRICK MYBURGH, M.R.C.S., L.R.C.P., S.A.M.C.
Capt. CHERUKAT PADMANABHAM NAIR, I.A.M.C.
Major (Temp.) EDWARD HARVEY RATCLIFFE SMITHARD, M.D., R.A.M.C.
Captain HARI CHAND TUGNAIT, I.A.M.C.
Capt. RICHARD IVOR WILLIAMS, M.R.C.S., L.R.C.P., R.A.M.C.

M.B.E. (Civil Division)

RANGACHARI PADMANABHA CHARI, F.R.C.S.Ed. Civil Surgeon, Jubbulpore, Central Provinces and Berar.

ALEXANDER FRANCIS RITCHIE CRAWFORD, M.B., Ch.B. A prominent medical practitioner of Invercargill, New Zealand.

Sardar Sahib RAJINDER SINGH GREWAL, F.R.F.P.S., Civil Surgeon, Burma.

Khan Bahadur ABDUL HAMID, M.B., B.S. Assistant Director of Public Health, United Provinces.

Major KUNDAN LAL JETLEY, I.M.S. Retired M.O. i/c the Sikh Regimental Centre.

Rai Bahadur JIRWAN LAL, M.D. Formerly professor, King Edward Medical College, Lahore.

AMRATRAL UJAMSEE SHETH, M.B., B.S. For public services in Kenya.

LADY TATA MEMORIAL TRUST

International Awards for Research in Blood Diseases

The trustees of the Lady Tata Memorial Fund announce that, on the recommendation of the Scientific Advisory Committee, they have agreed, if circumstances permit, to make the following awards for research in blood diseases, with special reference to leukaemia, in the academic year beginning on Oct. 1:

Grants for Expenses and Assistance.—Dr. Jørgen Bichel (Denmark), for work at Aarhus, Denmark, and in the U.S.A.; Dr. Pierre Cazal (France), for work at Montpellier; Dr. Peter A. Gorer (Great Britain), for work in London; Dr. Maurice Guérin (France), for work in Paris; Dr. Werner Jacobson (Great Britain), for work at Cambridge; Dr. Edith Paterson (Great Britain), for work at Manchester; Prof. Edoardo Storti (Italy), for work at Pavia.

Scholarships (Whole-time or Part-time).—Dr. Jal J. Dubash (India, at present in U.S.A.), for work in New York; Dr. Pierre Dustin (Belgium, at present in Great Britain), for work in London and Brussels; Dr. Simon Iversen (Denmark), for work in Copenhagen; Dr. Joseph Japa (Poland, at present in Great Britain), for part-time work at Edinburgh; Dr. Hall Schartum-Hansen (Norway), for work probably at Manchester.

A Ministry of Health Circular (103/46) announces that it has been decided to discontinue the Government Lymph Establishment maintained by the Ministry at Colindale Avenue, N.W., and to arrange for lymph required for public vaccination against smallpox to be produced by the Lister Institute of Preventive Medicine and distributed through the 27 laboratories in England and Wales whose addresses are given in an appendix. The change will take effect from July 1. Before the new arrangements start public vaccinators will receive from the Government Lymph Establishment a supply of revised application forms, which alone should be used on and after that date. If the repeal of the Vaccination Act becomes law under the National Health Service Bill the office of public vaccinator will be abolished, but in that event the same general arrangements will continue for the supply of lymph to all doctors with whom local health authorities arrange to provide free vaccination as contemplated in the Bill.

Nova et Vetera

MYIASIS, "FILLAN," AND "THE MORGELLONS"

Two recent reports (Turner, 1945; McCarthy, 1945) have drawn attention to the occurrence in man of infestation by *Hypoderma* larvae, giving rise to creeping myiasis. Although Brumpt (1927) states that this condition, which he calls *myiase sous-cutanée à tumeurs ambulatoires*, is well known to the country folk in Norway, Ireland, Scotland, and Brittany, it may be of interest to quote the following account taken from *A Description of the Western Islands of Scotland*, by M. Martin, Gent., first published in 1703.

"Allan Macleod being about ten years of age, was taken ill of a pain which moved from one part of his body to another, and where it was felt the skin appeared blue; it came to his toe, thigh, testicles, arms, and head; when the boy was bathed in warm water he found most ease. The hinder part of his head, which was last affected, had a little swelling: and a woman endeavouring to squeeze the humour out of it, by bruising it on each side with her nails, she forced out at the same time a little animal near an inch in length, having a white head sharp pointed, the rest of its body of a red colour, and full of small feet on each side. Animals of this sort have been seen in the head and legs of several persons in the isles, and are distinguished by the name of Fillan."

This case occurred in the Isle of Skye. Elsewhere in the same book Martin gives a shorter description of a case in Harris. In the second instance "a little worm, about half an inch in length, and about the bigness of a goose-quill, having a pointed head, and many little feet on each side," was drawn out of the flesh of a man's cheek.

According to Macleod (1934) Martin Martin was born in Skye c. 1655–60, graduated M.A. at Edinburgh University in 1681, and between 1686 and 1692 acted as "governor" to young MacLeod of Dunvegan. In 1697 he contributed to the Royal Society the first of two papers which formed the groundwork of his volume of 1703. Martin entered the University of Leyden in 1710 and there graduated M.D.; he died in London in 1719.

About 30 years before Martin's account Sir Thomas Browne recorded a curious observation in "A Letter to a Friend":

"Hairs which have most amused me have not been in the face or head, but on the Back, and not in Men but Children, as I long ago observed in that endemial Distemper of little Children in Languedock, called the Morgellons, wherein they critically break out with harsh Hairs on their Backs, which takes off the unquiet symptoms of the Disease, and delivers them from Coughs and Convulsions."

Kellett (1935) has reviewed this passage in considerable detail and concluded that the reference is to comedones. This explanation is based on a study of a series of descriptions published between 1544 and the present century. It does not, however, cover the deliverance from coughs, noted by Browne, nor the fact that the "worms" mentioned by certain of the earlier writers quoted by Kellett were "wont to infest the muscles of the arms, calves, and back in young children."

The starting-point for an alternative speculation on the nature of the "morgellons" may be found in the migration of *Hypoderma* larvae through skin to muscles, thence to the viscera, particularly of the thorax, and finally to the subcutaneous tissue of the back. It is accordingly suggested that the passage, "they critically break out with harsh Hairs, etc.," may refer to the subcutaneous localization of such parasites, with the subsidence of irritation of the respiratory tract. An intriguing pendant to this hypothesis is that, as Kellett has pointed out, the word "morgellons," though unique, is almost certainly derived via Provençal forms from *muscula*, a little fly.

Dept. of Bacteriology, King's College, Newcastle-upon-Tyne. A. H. EMSLIE-SMITH, M.B.

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Reports of Societies

PENICILLIN PRODUCTION

The annual meeting of the Manchester Medical Society was held on May 1, and Prof. D. DOUGAL was elected president for the coming year.

Dr. J. B. M. COPPOCK, in an address on "The Story of Penicillin," referred briefly to the British discovery and preparation of penicillin from the mould *Penicillium notatum*, and described the commercial methods of producing penicillin by surface culture. This involved preparing the sterile medium and filling it into 70,000 quart (1.1 litre) bottles daily, with subsequent sterilization. After this the bottles were cooled and spray-inoculated under sterile precautions, each bottle receiving 1½ to 2½ million spores. After incubation at constant temperature and humidity, which were controlled by an air-conditioning plant, the contents of the bottles were separated from the mycelial felt, which was burnt. The culture fluid was clarified and then extracted by suitable solvents at an acid *p*H or by charcoal adsorption and subsequent elution with aqueous solvents and the extracts concentrated, and the dry sterile calcium or sodium salt of penicillin was freeze-dried after sterile filtration.

The solid penicillin salt thus isolated had a potency value of from 300 to 800 units per mg. It was examined analytically and tested for potency, sterility, toxicity, and the absence of pyrogens. If satisfactory it was issued for use either in ampoules or as sterile tablets for preparing solutions for injection, or else as a dusting powder, often diluted with sulphathiazole, for topical application to wounds. The sterile powder might also be compounded with sterile creams, prepared in the form of tablets for use in oral infections, or suspended in arachis oil or beeswax mixture for intramuscular injection. More recently administration by mouth had shown some promise, the vehicles examined including inorganic buffers, egg white, oily suspensions, and aluminium hydroxide gels. Unhardened gelatin capsules had also been used with success in an attempt to overcome the possible inactivation of penicillin by the acid in the stomach. Rectal administration could not be seriously considered until a method was found of protecting penicillin from the action of the destructive enzyme, penicillinase, produced by the bacteria in the lower bowel.

OPHTHALMOLOGICAL CONGRESS

The annual Congress of the Ophthalmological Society of the United Kingdom was held on May 30 and 31, and June 1, in London at the Royal Society of Medicine. There was a large attendance of members, with a number of distinguished visitors from Europe and the Americas.

The president, Mr. CHARLES GOULDEN, opened the congress and chose for the subject of his presidential address "Johannes Evangelista Purkinje."

Air Commodore P. C. LIVINGSTON and Mr. HAROLD RIDLEY opened a discussion on "Ocular Disturbances Associated with Malnutrition," in which Dr. DEAN SMITH, Dr. B. MARIENSTRAUSS, and Messrs. T. KEITH LYLE, C. DEE SHAPLAND, R. LINDSEY REA, A. SEYMOUR PHILPS, W. J. W. FERGUSON, A. H. LOWTHER, A. G. CROSS, J. D. FRASER, and several other members took part. It emerged from the discussion that the malnutrition experienced in the prison camps, more especially of the Far East, had caused definite eye symptoms, of which central or paracentral scotomata were the most important. The factors involved were by no means certain, but the lesions appeared to be due to vitamin imbalance rather than to absolute vitamin deficiency. The influence of tobacco was mentioned only to be discounted in the final consensus of opinion. It was felt that ophthalmology had an important part to play in the study of deficiency diseases, and that knowledge had been much increased by the unfortunate experiences of prisoners in this war.

The Bowman Lecturer of the year was Dr. ARNOLD KNAPP of New York, who read a paper on "Intracapsular Extraction." In a comprehensive survey of this subject Dr. Knapp disclosed his preference for the intracapsular operation. His description of the advantages and disadvantages of this more difficult type of cataract operation was fair, and he showed that in his hands it held no extra risks.

Annual Dinner

The annual dinner of the Society was held at the Royal College of Surgeons on the invitation of the President and Council of the College. Among the guests were Lord Moran, Mr. Eardley Holland, Sir Wilson Jameson, Mr. P. H. Adams, Mr. H. S. Souttar, and Mr. Hugh F. Powell. Guests from abroad included Prof. H. J. M. Weve (Utrecht), Dr. E. C. Gravemeyer (Amsterdam), Dr. Mérigot de Treigny (Paris), Dr. Léon Coppez (Brussels), Dr. Leon Bauwens and Madame Van Boven (Antwerp), Dr. Jules François (Charleroi), Dr. A. Franceschetti (Geneva), Dr. B. Semadeni (Davos), Madame Noëlle Chome (Lausanne), Dr. W. H. Melanowski (Warsaw), Dr. Miguel Millan (Chile), Dr. H. Gjessing (Drammon, Norway), Dr. Gunnar Von Bahr (Uppsala, Sweden). Sir John Herbert Parsons proposed the health of the guests, and Dr. Arnold Knapp and Air Marshal Andrew Grant replied.

The annual general meeting was held next day and the officers for the ensuing year were elected. The remaining two days were devoted to the reading of clinical papers by members as follows:

Dr. I. C. MICHAELSON: "Traversing Intra-ocular Foreign Bodies with Retinal Detachment." Dr. A. LOWENSTEIN, Dr. I. C. MICHAELSON, and DR. J. HILL: "Perivasculitis Retinae of the Young (Eales's Disease)." Dr. A. J. BALLANTYNE: "Nerve-fibre Pattern of the Human Retina." Mr. EUGENE WOLFF: "Muco-cutaneous Junction of the Lid Margin, and the Distribution of the Tear Fluid." Mr. E. F. FINCHAM: "Recent Developments in Artificial Eyes." Dr. MARY CRIPPS: "Treatment of Traumatic and Inflammatory Lesions by *X* Rays and Short-wave Diathermy Combined." Mr. V. D. GIRI: "Technique of Intracapsular Extraction of Cataract with Retention of Conjunctival Bridge." Dr. C. L. SCHEPENS: "Is Malnutrition the Cause of Tobacco Amblyopia?" Mr. T. W. LETCHWORTH: "Stereoscopic Vision in Monocular Aphakia." Dr. MELANOWSKI (Warsaw): "Pages in the History of Ophthalmology in Poland." Dr. A. SEYMOUR PHILPS: "Retinal Venous Changes in Diabetes."

The Association for Scientific Photography amalgamated with the Royal Photographic Society on March 1, 1946. The work of the Medical Group of the A.S.P. is to be continued, since no time was lost in forming a similar group after the amalgamation. A Medical Photography Group, to deal with all photographic processes connected with medical science, was formed on April 1, and Surgeon Rear-Admiral Cecil P. G. Wakeley was elected its chairman. Those interested who are already members of the R.P.S. should apply to Mr. E. J. Andrews, hon. secretary, Medical Group; while those who do not belong to the R.P.S. should apply to the hon. secretary, Royal Photographic Society, 16 Princes Gate, London, S.W.7. The entrance fee to the R.P.S. is one guinea, and the annual subscription two guineas; the Medical Group subscription is 5s. per annum.

CHEMICAL RESEARCH EXHIBITION

An exhibition, organized by Imperial Chemical Industries, is open until the end of June at 22, Lower Regent Street, London, to demonstrate some of the recent advances in British chemical research. The exhibition has been mounted most attractively, bringing home to the public in pictures and models and in the fewest possible words the significance of each achievement. In this it has been helped by one of the discoveries—namely, the plastic known as "perspex," which is being used not only for prisms and lenses and for surgical and dental equipment, but also for effective display purposes, lending itself as the medium for artistic designs. One section of the exhibition is devoted to the new insecticide "gammexane." This is adorned by a portrait of Michael Faraday, for the origin of this recent introduction was Faraday's preparation of benzene hexachloride more than 120 years ago. It has been long known that this substance had insecticidal properties, but the particular constituent which gave it its destructive nature has only lately been determined. In the form of a smoke pellet it produces a cloud which settles on walls and other surfaces, which are thereupon made lethal to insects alighting upon them, but are not injurious to man or animals. It is also effective against the migratory locust, and on the request of U.N.R.R.A. ten tons have recently been flown to Sardinia, where crops were threatened by a locust invasion from Africa. The exhibition includes sections illustrating the sulphonamide drugs as well as penicillin and paludrine.

Correspondence

National Research into Tuberculosis

SIR,—I wish to associate myself whole-heartedly with the plea of Drs. S. M. Hilton and George Luntz (June 1, p. 850) for national research into tuberculosis. May I also add a plea for a nation-wide effort to provide facilities for treatment? The number of cases diagnosed is increasing, but every-day facilities for treatment, never adequate, grow less and less as beds close for lack of nursing and domestic staff. By the time many cases reach a chest hospital or sanatorium the favourable opportunity for treatment has often passed and in all probability the seed of new cases been sown. Cannot something be devised to make the staffing of such institutions attractive, and so form some organization to utilize the service of ex-patients in this way? The present position is tragic.—I am, etc.,

Cranham, Gloucester. M. A. KIRKMAN.

SIR,—It would appear that before there can be national research into tuberculosis we of the medical profession must first examine our consciences. Surely there must first be set in motion a world-wide campaign against ignorance, prejudice, and the appalling apathy which still undoubtedly exists in regard to the disease. This apathy towards the greatest medico-social problem known is the more startling when one reflects that it exists equally within, as without, the medical profession. Dr. F. Heaf (March 2, p. 327) writes: "One has only to attend a few meetings of the Tuberculosis Association to realize the keenness of its members, the interest which they take in new methods of treatment, and their readiness to assist sufferers from this disability in every possible way." If these words could be written of the medical profession at large there would still be no room for our present complacency. As it is the odds are too greatly against the comparatively few enthusiasts who have made the eradication of tuberculosis their ideal in life. That they have not long ago become discouraged is a tribute to their zeal and steadfastness of purpose.

The disinterested attitude of many doctors may be summed up with a few instances. Take the young practitioner who remarks: "How can one possibly be interested in such a dull and chronic disease?" Take the numbers of newly diagnosed cases of established pulmonary tuberculosis, seen by any T.O. anywhere, whose histories too often open on such lines as, "My doctor has been treating me for bronchitis for the past twelve months." Take the houseman who writes a sparse note to the T.O., saying, "So-and-so is riddled with Tb. and is a menace in any ward." This attitude is defeatism or, even worse, downright lack of interest in a highly important clinical entity. Neither are tuberculosis workers entirely blameless, as witness the numbers of patients one sees with contra-selective collapses and persistently yawning cavities, with continued positive sputum from artificial pneumothoraces which should never have been induced in the first instance but for the satisfaction of meddling physicians and over-anxious patients. Thus is brought into ill repute the best therapeutic measure yet revealed to us, the cure becoming worse than the disease.

The doctor who gives the matter any thought must ask himself why it is that the treatment of tuberculosis has stood still for so many years, while more abstract medicine progresses year by year. The explanation must be apathy towards tuberculosis. It cannot be anything else. Drs. S. M. Hilton and George Luntz (June 1, p. 850), in pointing out the obvious lack of interest in the present correspondence, write: "It is an unhappy reflection on the outlook of the medical profession that it is so ready to dilate on medical minutiae, whereas fundamental issues leave it entirely unmoved." Can it be that the problem of tuberculosis is so fundamental that we fail to see it in a true perspective? If this be so then a change of attitude, of outlook, of approach, a readjustment of our minds to the magnitude and importance of the problem, is half a century overdue. Until we rouse ourselves to wakefulness, shout the dangers of contagion in the public ear, make educational use of the cinema, the microphone, the hoarding, and practise the better those therapeutic measures we already possess, we can hardly expect to set benevolently inclined Governmental consciences on fire with a devouring enthusiasm for national research into tuberculosis.

That national research is an absolute necessity there is no doubt; that it will continue to be so is a certainty—unless and until the profession as a whole awakes from its present complacent lethargy and realizes, once and for all, that tuberculosis is not alone a subject for the tuberculosis officer and the sanatorium authorities but is in fact a problem of such magnitude that it requires the fully conscious consideration, the sympathy, and the concerted attention of every medical man worthy of the name. When we have gained that unity of consciousness and awareness and have ceased to relegate the problem of tuberculosis to the realms of impossibilities, then international research into tuberculosis will long since have already begun.

The impressions that have prompted this letter have been collected throughout several years of work in chest hospitals, clinics, and sanatoria in various parts of England. Impressions collected in Ireland point to the fact that prevailing conditions there are no better. The general practitioner everywhere, on whom, more than any other, rests the responsibility for early diagnosis, is in fact too often the least interested member of the medical community. In younger practitioners this is hardly surprising when one recalls the medical school curricula that give the subject of tuberculosis an equal place with that of the common cold. Now is the time for a change of heart. Now is the time for interest, alertness, action—for research. Let us be in the correct state of grace and knowledge to receive the chemotherapeutic elixir and to use it intelligently when it arrives. If we don't, the accusing finger of the tuberculous population will for ever be upon us.

In conclusion, Sir, I would make a quotation from one William Lloyd Garrison:

"I am aware that many object to the severity of my language; but is there not cause for severity? I will be as harsh as Truth and as uncompromising as Justice. On this subject I do not wish to think, or speak or write, with moderation. No! No! Tell a man whose house is on fire to give a moderate alarm; tell him to moderately rescue his wife from the hands of the ravisher; tell the mother to gradually extricate her babe from the fire into which it has fallen—but urge me not to use moderation in a cause like the present. I am in earnest—I will not equivocate—I will not excuse—I will not retreat a single inch—and I will be heard. The apathy of the people is enough to make every statue leap from its pedestal and hasten the resurrection of the dead."

—I am, etc.,

Dublin. JOHN ST. P. COWELL.

Blindness in Nigeria

SIR,—It is to be deplored that F. E. Stock, in his article of April 6, 1946, on "Blindness in an Urban Centre in Nigeria," made reference neither to trachoma nor to onchocerciasis. Trachoma is by far the most common cause of blindness in West African Colonies, and onchocerciasis probably causes more blindness than (*a*) ophthalmia neonatorum, (*b*) keratomalacia, and (*c*) smallpox put together.

(*a*) Ophthalmia neonatorum is surprisingly uncommon despite the prevalence of gonorrhoea and the paucity of treatment.

(*b*) Vitamin A deficiency in natives, exposed all day to the sun and whose diet is rich in red-palm oil, is a rarity.

(*c*) Corneal lesions are a well-known complication of smallpox, occurring in 3% of cases (Monte), but more than 10% of Nigerians have trachoma and more than 50% are infested with onchocerciasis, of whom one-third have ocular lesions (J. G. S.).

—I am, etc.,

Johannesburg. J. GRAHAM SCOTT.

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Migrainous, Ciliary, and Post-traumatic Headaches

SIR,—Dr. Wilfred Harris's paper on migrainous, ciliary, and post-traumatic headaches (May 18, p. 754) is very interesting, but open to severe criticism from at least one point of view.

He talks light-heartedly of the "loss of corneal reflex" after his injections, but surely he must be aware that the correct description would be "complete loss of corneal sensation," with its attendant loss of trophic nerve supply. I have seen so many cases with corneal ulceration, and more or less complete "invalidism," or even blindness, of the eye after interference with the Gasserian ganglion that I have grave doubts if the operation is justifiable. Most of these cases can be kept comfortable only by permanent closure of the lids by tarsorrhaphy.

Does Dr. Harris see his cases and inquire about their eyes six months or a couple of years later? And does he put it to the patient that the cure of his pain will almost certainly involve interference with the functions of the eye? I am all too well aware of the number of people who suffer from

intractable headaches, and of the amount of misery that they suffer—without a great deal of help from their physicians or ophthalmologists—to belittle any effort to find permanent relief, even if it is not really a cure.—I am, etc.,

Plymouth. CECIL B. F. TIVY.

Placement of the Disabled

SIR,—While welcoming the publicity given to the Disabled Persons Act by your leading article (May 25, p. 803) I must call attention to some of the inaccuracies it contained. This is the more important since the successful working of the Act largely depends on the co-operation of doctors, many of whom are still ignorant of the provisions of the Act, and in whose enlightenment the medical journals must play a leading part.

1.—The Ministry of Labour has no power to direct labour to a firm employing less than 2% of disabled persons. All it can do is to take advantage of the obligation which the Act imposes upon employers to find suitable employment for disabled persons. In others words, it *is* more concerned with finding work than with "directing labour."

2.—The statement that Ministry officials do not regard as disabled persons who are in employment is not true. Any such attitude would be contrary to the Act and quite untenable. The D.R.O.s and the District Advisory Committees have had this made clear to them, and it is to be hoped that doctors also will realize that a man who is able to do his present work successfully is not debarred from admission to the register. Some half a million people have been registered, and the vast majority are in employment; 95% of the applications have been accepted by the D.R.O.s direct, and of the 5% referred to committees, 2% have been accepted. These figures surely disprove the statement that D.R.O.s have little responsibility. What is true is that they have no power to compel the disabled person to come to them or to act on their advice, and surely no one would wish them to have this power.

3.—While the figures given as to the distribution of disabilities found in disabled persons may or may not be true, it is, however, known (*Ministry of Labour Gazette*, April, 1946) that the distribution of the disabilities of disabled persons *who have registered* is as follows: surgical 50%; medical 30%; psychiatric 5%; others (blind, deaf, etc.) 15%.

4.—It has always been obvious that the D.R.O.s would need informed medical help, and steps have been taken to see that this is forthcoming. Moreover, in order that this medical guidance may improve in quality, a follow-up of placed persons has been arranged. It must be remembered, however, that the final word concerning employment rests with the employer, whose co-operation is vital to the success of the Act.

The suggestion that the Ministry of Labour does not exchange information with hospitals and doctors is not true. This is done after obtaining the applicant's consent. It is, however, noteworthy that the British Medical Association, by refusing the use of the medical report D.P.1, which is needed for successful placing, is hindering the very object which the article purports to seek.—I am, etc.,

RONALD E. LANE,
Member of the National Advisory Council on the Disabled Persons (Employment) Act.

Manchester.

*** The B.M.A. has never advised individual doctors or hospitals to refuse to use D.P.1, though it does not approve this form of report. It does not consider that this complicated form can provide the "informed medical help" referred to in 4 and has consistently urged that medical boards should be set up to report on disabled persons in hospital and to advise D.R.O.s on the medical issues involved.—ED., *B.M.J.*

Paralysis Agitans and Cervical Sympathectomy

SIR,—The reply in "Any Questions?" on the treatment of paralysis agitans (May 18, p. 784) and also the letters about Parkinson's disease stimulate me to report the result of treatment of these patients by cervical sympathectomy.

I have operated on seven patients (three men and four women) with paralysis agitans or post-encephalitic Parkinsonian tremor; three were diagnosed as cases of post-encephalitic tremor and four as Parkinson's disease. All the patients operated on had been diagnosed and treated at one or several of the hospitals for nervous diseases in London. They were unrelieved and had found their way to that backwater of medicine, the massage department, where my orthopaedic colleague, Mr. Phillip Cutner, suggested the procedure of cervical sympathectomy. The patient in the first case was much better and was able to start work again. Consequently the operation was offered to other sufferers.

The procedure consisted in the removal of the stellate and first and second dorsal sympathetic ganglia, on the opposite side to the limb most affected by the tremor. When both limbs were affected, then a bilateral cervical sympathectomy was performed at separate sessions on three occasions. The rationale of the operation is to increase the blood supply of the brain.

The results are as follows: There have been no deaths. Four patients are much better (two men and two women); three are unchanged. Those who are improved were aged 33, 35, 36, and 45; those who are unchanged were aged 38, 45, and 68. No patient is worse for the operation. Three of the procedures were performed in 1942, one in 1943, one in 1944, one in 1945, and one in February, 1946. In those improved the tremor is lessened and controlled by medicine, whereas formerly it was uncontrollable. In one woman the tremor was so violent that when she folded her arms during the consultation to try and steady them the body and chair on which she sat shook freely. Resumption of some work has been possible. One woman volunteered that she could write again; another that she could sweep up and dust, previously impossible. The patients are brighter in personality and the mask face and eyes are improved; also the headaches. They still require medicine, but before operation they were unhelped by it.

This short series suggests that the operation of cervical sympathectomy is useful to patients under 45 with paralysis agitans or post-encephalitic Parkinsonian tremor. I report them in the hope that the remedy may be offered to others who are often otherwise derelicts.—I am, etc.,

London, W.1. HAROLD DODD.

Penicillin and Venereal Diseases

SIR,—Dr. H. W. Neville Mascall's letter (May 25, p. 813) was a timely warning against the indiscriminate use of penicillin, its possible influence on the diagnosis of syphilis, and the production of "fastness," but I would like to add my comments on another aspect of the problem which affords me little cause for complacency on the occasion of the general release of penicillin.

Several years ago I wrote about the abuse of the sulphonamide compounds in the treatment of gonorrhoea. The practice then of patients being referred to clinics with the history of having been treated for a genital discharge with sulphonamides, often in inadequate dosage, without any efforts having been made to ascertain the site or aetiology of the discharge, is still unfortunately quite common. The apparent simplicity and rapidity of penicillin treatment have made a wide appeal, and I fear that it may lead to an increased scope of activity of this unscientific procedure to include suspected syphilitic sores without preliminary recourse to diagnostic measures.

May I therefore express the hope that practitioners who encounter patients suspect of being affected with venereal disease will either (*a*) refer them direct to a clinic, or (*b*) establish a definite diagnosis and ascertain the best therapeutic methods and methods of testing for cure prior to the institution of any "shot in the dark" technique. Failure to do so can only result in an increase in the numbers of undiagnosed, misdiagnosed, and uncured cases, and there are already plenty of these without further contributions.

Much has been learned about the treatment of venereal diseases with penicillin, but still a great deal remains unknown, and it is no secret to state that specialists are still undecided about the exact place of penicillin in the management of syphilis, and opinions are also divided in regard to the best method of administration in the treatment of gonorrhoea.—I am, etc.,

County Hospital, Durham. W. GILLIES ANNAN.

Rectal Cancer in Sisters

SIR,—The magisterial rebuke administered by Mr. P. J. Hilton and Dr. S. M. Hilton (May 25, p. 814) to Dr. R. E. Rewell reminds me of Bacon's essay, "Of Seeming Wise." Perhaps that is why Dr. Rewell did not comment upon it. The probability that a random sample of order of magnitude 20 to 30 extracted from a "population" of 300,000 women between the ages of 25 to 35 would contain one or more pairs of sisters *is.* on any

reasonable hypothesis, extremely small. The magisterial critics are quite justified in saying that the probability of other events might be smaller still. I was told many years ago that a zoologist with a large family of daughters christened them with the generic names of Polychaeta, which are pleasant names—Nereis, Aphrodite, Eunice, etc. It is not likely to be a common practice, and the probability that the sample would contain two young women each named Nereis might very well be much smaller than the probability of including two sisters. But probabilities, like other measures, are great or small in relation to other probabilities. An addition to or subtraction from the annual income of, say, an emeritus professor, of £50 means much more to him than the same change in the national income means to Dr. Dalton. When an event occurs which on some hypothesis, say that of "chance," is very rare, any sensible person asks himself whether there is a reasonable alternative explanation. Dr. Rewell, like a sensible man, has entertained the alternative hypothesis—that the events were *not* independent, that there *might* be a genetic correlation. He did *not* say that correlation had been proved. If the rare event had been the appearance of two persons named Nereis, as the *a priori* probability that having a particular Christian name predisposes a person to die of cancer is extremely small, no sensible person would entertain the alternative. He would simply conclude that a very improbable event had happened—as improbable events do happen every day; in fact every time four people sit down to play a hand at bridge.—I am, etc.,

MAJOR GREENWOOD.

Animal Physiology

SIR,—Our attention has recently been drawn to a review of our book, *The Physiology of Farm Animals*, which appeared in your issue dated May 4. The reviewer calls attention to certain so-called "factual errors," 32 of which he claims to have listed, and later advises students desiring reliable information on the physiology of domestic animals to read the late Sir Frederick Smith's *Manual of Veterinary Physiology*. Of the so-called factual errors quoted by the reviewer, two—namely, that referring to the grazing horse and that referring to the cure of the swollen legs by moderate exercise—are included in the textbook to which he directs students' attention; and since he states that he is not aware "that horses whose legs become swollen or oedematous through much standing may often be cured by moderate exercise" we are left in considerable doubt as to whether the reviewer has carefully read the book he so warmly recommends. The description of the tuberculin test given in our book (p. 144) is correct and was not intended to be a description of the double intradermal test to which the reviewer is probably referring when making his criticism. In criticizing us for giving a range of temperature in the case of the hen, the reviewer is probably unaware that such a wide range exists; incidentally, the alleged correct temperature quoted—104.5° F.—is that of the broody hen and not the non-sitting hen, whose average mean temperature is 106.7° F. Moreover, the other so-called errors cited express differences of opinion and cannot be characterized as actual errors.

Finally, we would call attention to the fact that the book recommended as an alternative to ours, excellent though it may have been at the time of publication, is now quite out of date, particularly in the sections relating to endocrinology, vitamins, and the physiology of reproduction.

We apologize for troubling you with this letter, but thought it only right to inform you that the review itself contains errors and is scarcely helpful.—We are, etc.,

F. H. A. MARSHALL.
E. T. HALNAN.

School of Agriculture, Cambridge.

Shock Treatment of Bronchial Asthma

SIR,—I am much interested in Dr. E. Brauer's letter (June 1, p. 849) on the "pyrifer" treatment of asthma. The method he advocates is certainly heroic when one considers how asthmatics have a nasty and unexpected way—at times—of reacting severely to any foreign protein, especially if injected intravenously.

I have practised for some years now the non-specific protein treatment (using Koch's old tuberculin, and more recently P.P.D.), and although my series of cases is as yet too small for definite conclusions to be drawn, the results so far obtained seem to agree with those of Maxwell (*Journal*, 1930, **1**, 854) and others. Complete disappearance of the attacks can be obtained in over 30% of the cases treated. My final doses (as much as 0.5 ml. of the old tuberculin) are generally higher than those recommended by Maxwell and others. In the more refractory cases possibly an optimum maintenance dose at one to three months' interval might be advisable. But if one could feel entirely satisfied that the method suggested by your correspondent was really free from the possibility of dangerous reactions, a real advance in the treatment of asthma will have been made.—I am, etc.,

Kingussie. FELIX SAVY.

Congenital Malaria

SIR,—Since the publication of the paper on this subject (March 23, p. 432) I have had a report from Prof. Eckstein of three more cases that he had seen in his clinic at Ankara during the month of January, 1946. At that time the mean temperature was below 0° C. Under such conditions in Turkey all surviving anopheles are hibernating and do not bite. The mother of one of these babies was for some time in hospital under treatment for osteomalacia. For years she had suffered from untreated malaria. Her labour started with an attack of fever and she was delivered by Caesarean section. After birth the baby developed pyrexia. Its blood was negative on the first examination but positive on the second.

Dr. R. F. Jarrett (April 27, p. 662) has himself seen cases of congenital malaria during his stay in Turkey. In his bibliography he refers to the case which occurred in London and was reported by Tanner and Hewlett (*Lancet*, 1935, **2**, 369). Sir Philip Manson-Bahr was called in consultation to this. They suggested that in the absence of a known placental trauma or infarct, premature placental separation was the most probable cause of the transmission of the infection.

Since my return from abroad I have had access to further literature. K. T. Chen *et al.* (*Chinese Medical Journal*, 1944, **62**, 190) have collected 39 cases of congenital malaria from the world literature. In some of these the infant's blood was positive on the first day after birth. The case they reported was that of a baby born in mid-winter in Chungking. Wickramasuriya (*J. Obstet. Gynaec. Brit. Emp.*, 1935, **42**, 816) has had an extensive experience in Ceylon and has made a comprehensive study of malaria in pregnancy. He is of the opinion that transplacental foetal infection with malaria occurs more often than is supposed. In his paper he records 6 cases of babies in whom transplacental foetal infection was proved. The infecting parasite was *P. falciparum*. He has demonstrated infecting parasites in fresh foetal brain squash under the microscope without any staining. In these cases he has easily seen living and dead parasites in the cerebral capillaries.

Placental transmission is a subject worthy of further research. The wonder is that the disease is not transmitted to more of the offspring of the millions of pregnant women suffering from malaria.—I am, etc.,

London. W. C. W. NIXON.

*** This correspondence is now closed.—ED., *B.M.J.*

Infantile Paralysis Fellowship

SIR,—May I draw the attention of the medical profession to the Infantile Paralysis Fellowship? Founded in January, 1939, the I.P.F. now has a membership of some seven hundred. We are affiliated to the Central Council for the Care of Cripples, and out of our executive committee of ten, eight are disabled persons. It is one of the few organizations *for* the disabled run *by* disabled. With the recent increase of fresh cases—both civilian and Service—many a lonely sufferer from anterior poliomyelitis may be happy to associate with fellow-sufferers who have faced and largely overcome the problems of this terrible scourge, and we appeal to members of the medical profession to bring our existence to the notice of any polios they may be treating. Briefly, our objects are:

1. To associate sufferers from infantile paralysis in fellowship for the encouragement and development of their interests and abilities.
2. To find means of training its members and, where necessary, of re-educating them, for occupations in which they can support themselves and make their contribution to the economic and social life of the community.

3. To afford the less badly handicapped the opportunity of knowing other members more severely disabled than themselves and of rendering service to them.

4. To alleviate the loneliness of friendless sufferers from infantile paralysis, and to bring all those who need advice and assistance into contact with available sources of help.

5. To arouse the social conscience on the problems and difficulties encountered by the paralysed and, as opportunity serves and need arises, to influence legislation on their behalf.

I shall be happy to send literature to anyone interested.—I am, etc.,

FREDERIC MORENA,
Secretary.

18, Nassau Street, Mortimer Street, W.1.

Sir William Macewen

SIR,—In the review (June 8, p. 879) of Tanner's *Sir W. Arbuthnot Lane* it is stated that "Macewen was a brilliant craftsman who made outstanding advances." *Virgilium 'vidi tantum.* I was only a student and dresser in Macewen's wards. His craftsmanship was superb, but to suggest that it was nothing more is surely a form of meiosis. One of his aphorisms was that it was possible to become a surgeon with a shaky hand but not with a shaky head, and a second was that a brilliant surgeon was a dangerous one. The foundations of his practice and surgery were intense and prolonged research, seasoned judgment, and vast experience; witness his papers on the growth of bone, on pyogenic diseases of the brain and cerebral localization, on tuberculosis of bones and joints, etc. He was indeed a pioneer in surgical pathology. Whistler stated in a famous lawsuit that it took a lifetime to paint his "Nocturne," though the actual execution might be a matter of hours. I should imagine that when Macewen became a Fellow of the Royal Society it was in recognition of his full status as an artist in the science of his profession.—I am, etc.,

R. M. WALKER.

Maybole, Ayrshire.

Convalescent Homes for Doctors

SIR,—I should like to put forward a suggestion which I think is worth discussing—namely, that we establish convalescent or rest homes for doctors and medical students. There must be many among us who cannot easily afford a good holiday after a period of strain or illness, and many others who, even if better off, would welcome the opportunity of recuperating in a congenial rest home or centre owned by the profession itself. Up and down the kingdom are scores of convalescent homes maintained and owned by different organizations. Why not convalescent homes for doctors too?

The profession could probably support several centres which might be situated in various parts of the country appropriate to the seasons and to different tastes—in the mountains, the country, or by the sea. Such centres would not, of course, be run for profit, but would take their part in a larger scheme of professional welfare that might ultimately—and indeed does already—include some of the valuable features of the old guild organizations. The necessary money could be obtained by subscriptions and by gifts. An annual subscription of half a guinea, for example, should entitle one automatically to the use of the centre; the weekly charge should be as low as the funds permitted. I am sure that it would not be long before enough money was collected to buy and maintain one or more centres where, amid beautiful surroundings, health might be restored. Once established, and if facilities were available, chalets could be built near the principal buildings to accommodate doctors' families also, thus making possible an integration which might otherwise be missing. I should be glad to learn what others think of this suggestion.—I am, etc.,

MAURICE MARCUS.

London, E.1.

Resumption of Treatment at Spas

SIR,—May I be permitted to add to Dr. G. D. Kersley's letter (June 1, p. 848) that it would be as well for doctors who wish to send their private patients to a spa to communicate with a spa physician well in advance of the proposed visit, intimating the nature of the patient's complaint, so that the necessary treatments may be reserved in good time, as, owing to shortage of staff, it is sometimes difficult to book treatments at short notice. Once the appointments are made any changes required can be easily obtained.—I am, etc.,

DONALD WILSON.

Bath.

Infected Clothing

SIR,—Since the health of the nation is as vital now as during the war years, may I be permitted to add a factor of some importance to the announcement contained in the paper by Dr. Ronald Hare and Miss Dorothy M. Mackenzie (June 8, p. 865) that clothing can act as a temporary carrier of germs and "may convey infection to others."

Recent laboratory tests carried out on inoculated garments to discover the relative germicidal efficiency of dry cleaning have provided convincing proof that modern process methods in purified solvent completely sterilize clothing and render a garment entirely germ-free. For the purpose of these tests, fabrics were inoculated with *Eberthella typhi* and pneumococci, and were then given eight different kinds of treatment. First treatment: the fabrics were agitated for ten minutes in the solvent at 70° Fahrenheit (21.3° C.). Second treatment: as the first and repeated three times. Third treatment: the ten minutes in the solvent was followed by a ten-minute treatment with dry-cleaning soap in the solvent, and finally a ten-minute treatment in solvent alone. Fourth treatment: as treatment No. 3, but with a sulphonated mahogany oil as the detergent in place of soap. Fifth treatment: thirty minutes in air temperature of 120° Fahrenheit (48.8° C.). Sixth treatment: a combination of treatments 2 and 5. Seventh treatment: a combination of treatments 3 and 5. Eighth treatment: a combination of treatments 4 and 5.

It is interesting to note that *Eberthella typhi* was reported as showing a much greater resistance to the dry-cleaning process than did pneumococci. Both germs, however, succumbed to the combination of solvent, soap, and hot air. The following table shows the results of the investigators' tests on the typhoid germ:

Treatment	Reduction of Bacteria Count
1	Not sterile
2	97%
3	100%
4	99%
5	81%
6	98%
7	100%
8	100%

The above treatments were even more effective on fabrics inoculated with pneumococci. They showed the following results:

Treatment	Reduction of Bacteria Count
1	100%
2	100%
3	98%
4	100%
5	100%
6	100%
7	98%
8	100%

Tests with the same series of treatments were also carried out on unsterilized wool, counting the bacteria present in the wool before and after each treatment:

Original Bacteria Count	Treatment	Reduction of Bacteria Count
600,000	1	99%
400,000	2	99%
600,000	3	99·5%
700,000	4	99·5%
1,800,000	5	91%
300,000	6	100%
2,300,000	7	99%
3,700,000	8	99%

At a time like the present, when clothes shortage is forcing prolonged and continual wear of garments, evidence of this bactericidal function is all the more welcome and cannot be too widely stressed, especially now that the health of the nation is so vital to the country's rehabilitation. When it is remembered that the treatment of garments at any dry-cleaning establishment is as thorough as that used for any one of the above tests, it will be realized how convincing is the proof that dry cleaning under modern hygienic conditions completely sterilizes clothing and thereby does, in fact, safeguard health.—I am, etc.,

S. J. BYRON,
Public Relations Officer,
Incorporated Association of London Dyers and Cleaners.

London, E.C.4.

Jittery Legs and Burning Feet

SIR,—The condition described by Dr. C. A. Jackson under the heading "Jittery Legs and Happy Feet" (March 30, p. 505) appears to be identical with the "burning feet" syndrome already fully described by C. Gopalan (*Ind. med. Gaz.*, 1946, **81**, 22). This author also refers to previous reports by Paraita and Stannus (the latter reference being *British Medical Journal*, 1944, **2**, 140). It is not clear whether Stannus used the term "burning feet," but that term was certainly used by Ackroyd of South India in a private communication to the then hon. secretary of the Assam Branch of the B.M.A. in either 1943 or 1944.

The condition is found, chiefly in S. India, under conditions rather similar to those encountered by Dr. Jackson—i.e., in people living on diets poor in riboflavin but containing parboiled rice and, therefore, sufficient aneurin to prevent the development of beriberi. That the condition is not due to lack of riboflavin itself was shown by Gopalan by the fact that riboflavin was not curative. The syndrome, together with the associated ariboflavinosis, was cleared up by autolysed yeast, and the syndrome itself was found to be curable by pantothenic acid, which had no effect on the associated ariboflavinosis.

While stressing that credit should be given to Gopalan for his full description and careful assessment of the therapy of this condition, one must congratulate Dr. Jackson on his very careful observation of the cases he saw among his fellow P.O.W.s.—I am, etc.,

KEMPTON P. HARE,
Hoogrijan, Assam. Medical Officer, Tingri Medical Association.

Socialism and the Pay-bed

SIR,—The resolution of the association representative of medical officers employed whole-time by the Middlesex County Council (Dr. Davies's letter, June 1, p. 847) prompts me to rebut the view expressed that "the pay-bed system in hospitals should terminate altogether; patients should receive extra privacy, etc., solely on medical grounds." These people appear to have lost their sense of values. Have they lived in this community without the infinite disparity of individuality and quality making any impact on their consciousness, or are they incapable of appreciating the vast diversity in different individuals as regards intellectual endowments? Has a man whose whole life represents strenuous effort at perfection in the art of living, using this term in its highest sense, and who has acquired a fine level of intellectuality and sensibility, to be thrown, when sickness occurs, without any attempt at selection or segregation, into a mixed company, necessarily containing, among others, the off-scourings of the community, such as have led self-indulgent, dissolute, vulgar, and perhaps even criminal lives, whose background is utterly foreign, antipathetic, and incompatible? Has it not occurred to the signatories of this resolution that their proposal would add severe mental suffering to already existing physical sickness and would impede recovery, and that this mental suffering would be most acute amongst the highest types, those to whom the community, if it only knew it, owes most and in whom, as progenitors, the hopes of future generations lie? Many of these would rightly and understandably refuse general hospitalization.

This kind of irresponsible thoughtlessness is unworthy of our learned profession. It panders to the Socialist desire for a levelling out, which resolves itself so often into a levelling down. Numerous similar acts of folly, aimed undoubtedly at wealth as such, forget or ignore the fact that there is a real aristocracy of natural intellectual endowment, character, rectitude, social desirability, and service (not the class usually referred to as aristocrats, who may or may not be desirable eugenic types). That these superiors may be found at many financial levels in the community goes without saying, but they are ruthlessly dragged down and obliterated in the vortex of Socialist revenge.

The stamping out of desirables goes on apace, and it cannot too often be emphasized that once lost these cannot be replaced. It is this dysgenic effect of Socialism which is its principal menace and condemnation. Socialism, so called, is in fact antisocial in many of its aspects. It takes no account of genes, and will eventually and inevitably drag down the quality of the whole nation. Medical men, trained as they are in biology and in a position to understand genetics, should see the implications of this and many like moves. Good hygiene and prolonged education will not replace desirable genes, which, once lost, are gone for ever. On our profession largely rests the responsibility of holding a correct balance between Nature and nurture and of instructing the community in biological affairs. They should show independence of thought and refuse the kind of subservience of which this document is suspect.—I am, etc.,

Grasmere. JAS. B. MACALPINE.

In the Words of Eliza Doolittle

SIR,—Dr. A. S. Barr's letter (June 8, p. 891) calls for some comment. On what grounds did he put his totally hypothetical question to his "local Spens Committee"? There were never any grounds for believing that the official committee would suggest a maximum of £1,500 per year for a practice as large as Dr. Barr's must be. Naturally enough the members of his committee replied with the words indicated; there are hundreds of other underpaid occupations which they would have found equally unattractive. It would have been more interesting to have been told their replies to the original question as to what remuneration they would have expected for the work indicated and to have compared these with the amounts proposed in the official Spens report.

There is one other interesting aspect of Dr. Barr's letter. He is obviously trying to attract sympathy for the "poor overworked doctor." It is possible that Dr. Barr did have to work as hard as he indicates during the war, when medical manpower was stretched to the limit. It is more than probable that his remuneration was considerably in excess of £1,500 a year and that he was looking after far more patients than any man can or should care for under the rather easier circumstances now existing. Perhaps he will now take unto himself an assistant, or, better still, will give a share in his overworked practice, free of premium, to some young man who has spent five or six years in the Forces, and will be only too happy to ensure that Dr. Barr can have most evenings, his half-day, and most Sundays free from the ties that he deplores. Incidentally, what would happen if Dr. Barr refused to sign certificates during his meal hours?—I am, etc.,

Margate M. CURWEN.

GENERAL MEDICAL COUNCIL

ELECTION OF DIRECT REPRESENTATIVES

The result of the voting in the recent elections of five direct representatives for England, one for Scotland, and one for Ireland, was as follows:

IN ENGLAND	
Harry Guy Dain, M.D., F.R.C.S.	12,208
Sir Ernest Kaye Le Fleming, M.D., B.Chir.	11,477
Noel Everard Waterfield, M.B., F.R.C.S.	10,081
John Wardle Bone, M.B., B.Sc.(P.H.)	9,822
Edward Andrew Gregg, L.R.C.P.&S.I.	9,776
Leslie William Hefferman, M.D., F.R.C.S.	4,556
James Edgar Outhwaite, M.B.	4,459
William Walters Sargant, M.B., M.R.C.P.	4,103
William Fraser, M.B.	3,738
William Macleod, M.B.	3,412
Albert James Clarke, M.B., M.R.C.S.	3,378
Gordon Reginald Ward, M.R.C.S.	3,202
Louis Francis Beccle, M.B., M.R.C.S.	2,950
IN SCOTLAND	
Robert William Craig, O.B.E., M.D.	2,490
James Burnet, M.D., F.R.C.P.	1,107
IN IRELAND	
Frank Kane, M.D., D.P.H.	1,334
Alfred Charles Seymour, M.B.	535

The following medical practitioners have accordingly been elected members of the General Council of Medical Education and Registration of the United Kingdom for a period of five years from June 30, 1946:

Dr. H. Guy Dain, Sir Kaye Le Fleming, Dr. N. E. Waterfield, Dr. J. W. Bone, and Dr. E. A. Gregg, representing the registered medical practitioners resident in England.

Dr. R. W. Craig, representing the registered medical practitioners resident in Scotland.

Dr. Frank Kane, representing the registered medical practitioners resident in Ireland.

Obituary

A. G. NICHOLLS, D.Sc., F.R.S.C., F.R.C.P.C.

We much regret to announce the death of Dr. A. G. Nicholls, who retired on grounds of health from the post of Editor of the *Canadian Medical Association Journal* in 1942; his friendship was valued by many colleagues in this country, and he upheld the tradition of cordial good will towards the British Medical Association.

Albert George Nicholls was born in 1870 at Shotley Bridge, Co. Durham, and went to Canada as a boy, passing out of the Montreal High School with the Davidson gold medal and the Lansdowne silver medal. He entered McGill University, and after obtaining his B.A. with a gold medal in classics began his studies in the medical faculty, where he graduated in 1894 with the final prize, and received the D.Sc. degree on his return from postgraduate study in Germany and Austria. He was a member of the teaching staff at McGill for seventeen years and then became professor of pathology at Dalhousie University and provincial pathologist for Nova Scotia. During the war of 1914–18 he was D.A.D.M.S. to a Military Division at Halifax with the rank of major, and returned to Montreal in 1925. He became widely known as an accomplished writer on medical subjects, and was co-author with the late Prof. J. G. Adami of *The Principles of Pathology*. A man of wide interests and culture, Dr. Nicholls wrote some fifty monographs and other medical and historical publications, and succeeded the veteran Dr. A. D. Blackader as Editor of the *C.M.A.J.* in 1929. In the words of an editorial tribute in our contemporary: "No trouble was too great for him in the editing of material, and if at times he seemed to be over-scrupulous he usually had something to show for it. He himself was possessed of an unusually lucid and easy style which had been acquired over many years of writing but was partly also a reflection of his clear and orderly mind. To this he added a temperament which was never ruffled and a dignified tenacity of purpose. His pleasant, easy manner was greatly missed when he retired from his editorial work, to which he was so attached and which he did so well." To this we would like to add a line of gratitude and appreciation on behalf of British visitors to Canada, who enjoyed the hospitality of Dr. and Mrs. Nicholls and owe them thanks for many acts of kindness.

JAMES TAYLOR, C.B.E., M.D., F.R.C.P.

Dr. James Taylor, who died in London on June 6 aged 87, had long outlived his fellow-members of the famous group of neurologists who worked at the National Hospital, Queen Square, during the close of the nineteenth century, which included John Hughlings Jackson, William Gowers, David Ferrier, and Victor Horsley. He was joint editor with Sir William Gowers of the *Manual of Diseases of the Nervous System*, which went into a third edition in 1899, and published *Paralysis and other Diseases of the Nervous System in Childhood and Early Life* in 1905. He edited the *Neurological Fragments* of Hughlings Jackson, with a biographical memoir, in 1925, and was responsible for the two volumes of Jackson's *Selected Writings* six years later.

Born on March 17, 1859, at Forres, Morayshire, son of Peter Taylor, he was educated at Forres Academy and the University of Edinburgh, where he graduated M.A. with honours in natural science in 1883, M.B. in 1886, and M.D. in 1890. After working in Edinburgh as resident physician at the Royal Hospital for Sick Children and the Royal Infirmary he visited neurological and eye clinics in Germany and then became house-physician, and afterwards pathologist, at the National Hospital for Nervous Diseases in Queen Square, London; later he was elected to the honorary staff there, and to the Moorfields Eye Hospital as physician; also to the Queen's Hospital for Children in Bethnal Green. He became a Fellow of the Royal College of Physicians of London in 1897. He had been medical referee to the Pensions Commutation Board and a member of the consultant staff of the Convalescent Home for Officers at Osborne; he was also for a long time honorary physician to the Royal Scottish Corporation, and chief physician to the Guardian Assurance Company, and deputy medical referee to the Treasury. He was created C.B.E. in 1920.

At the Royal College of Physicians James Taylor had been a member of the Council for three years and examiner in 1920–4. His long service on the staff at Moorfields and the appreciation of his ophthalmic colleagues were marked by his election as president not only of the Neurological but also of the Ophthalmological Section of the Royal Society of Medicine, and for a time he acted as secretary of the Ophthalmological Society of the United Kingdom; he had also been president of the Harveian Society of London. He joined the B.M.A. in 1894 and in the following year was secretary of the Section of Psychology at the Annual Meeting in London; in 1913 he held office as president of the Section of Neurology and Psychological Medicine at the Brighton Meeting. His last published writing was a note on herpes zoster and chicken-pox which appeared on Sept. 22, 1945, in these columns; it was a postscript to earlier contributions by him on that subject in 1920.

Dr. GORDON HOLMES, F.R.S., writes:

The death of Dr. James Taylor has removed another from the survivors of a generation that inaugurated a new era in medicine and particularly in neurology. For several years he was closely associated with Hughlings Jackson and Gowers in both their private lives and their hospital practices, and after their retirement he carried on the tradition of careful clinical investigation and scientific analysis of symptoms that distinguished their work in the wards of the National Hospital. He collaborated with Gowers in the revision of the first volume of his celebrated *Manual*, and by republishing many of Jackson's more important papers in *Neurological Fragments* and *The Writings of Hughlings Jackson* brought to more general notice the work of one who has had an exceptionally influential role in the development of modern neurology.

Taylor was on the whole reserved, but those privileged to enjoy his friendship found in it warmth, sincerity, and unassuming sympathy and readiness to help and advise. Outstanding features of his character were tolerance and practical common sense. That the latter distinguished his professional work was shown by the frequency with which he was consulted by fellow practitioners in search of advice in their own illnesses and those of their relatives.

A. F. VOELCKER, M.D., F.R.C.P.

Dr. Arthur Francis Voelcker, consulting physician to the Middlesex Hospital and to the Hospital for Sick Children, Great Ormond Street, died at his home in Cornwall on June 9, aged 84.

He was born at Cirencester in 1861, the fourth son of Prof. Augustus Voelcker, F.R.S., the agricultural chemist. Educated at University College School and Hospital he qualified in 1884, took the M.B. and B.S.Lond. degrees with honours in 1886, and proceeded M.D. two years later, after postgraduate study in Berlin, Vienna, and Paris. He was for twenty years a member of the visiting staff of the Hospital for Sick Children, and after his retirement from active work at the Middlesex he was elected consulting physician to that hospital and emeritus lecturer on medicine in the medical school; he was also for a long time honorary physician to St. Luke's Hospital when it was in Old Street, and consulting physician to St. Columba's Hospital, St. Saviour's Hospital, the Surgical Aid Society, the London City Mission, and other charities. During the 1914–18 war he held a commission as major, R.A.M.C.(T.). He had been elected a Fellow of the Royal College of Physicians in 1897 and served on its Council in 1918–20.

Voelcker examined in medicine for the University of Aberdeen, the University of Birmingham, the English Conjoint Board, and the Society of Apothecaries; he had been president of the Section of Medicine of the Royal Society of Medicine, and honorary librarian, and in 1918 president, of the Medical Society of London. He joined the B.M.A. in 1886 and held office as vice-president of the Section of Diseases of Children at the Brighton Meeting in 1913. He published a number of articles, mainly on paediatrics, in this and other journals, and contributed to the *Encyclopaedia Medica*, to Garrod and Batten's *Diseases of Children*, and to the *Index of Treatment*. After retirement from active medical work he went to live at Marhamchurch, near Bude in North Cornwall, where he enjoyed fishing, shooting, and gardening, and the company of old friends. While an undergraduate he had distinguished

himself in athletics as a member of the L.A.C., and twice in his middle years of life the London medical students elected him president of the United Hospitals Athletic Club.

H. G. EARLE, LL.D., M.B.

Dr. Herbert Gastineau Earle, who became director of the Henry Lester Institute of Medical Research and Preventive Medicine, Shanghai, in 1928, died suddenly on June 5 at sea after a short illness.

He was born at Acton, Middlesex, on Aug. 10, 1882, and from the City of London School entered Downing College, Cambridge, in 1901 with a foundation scholarship, and gained first-class honours in the Natural Sciences Tripos of 1903. After clinical study at the Westminster Hospital he took the M.A. and M.B. degrees at Cambridge in 1913, by which time he had been for some years demonstrator of physiology at the Middlesex Hospital Medical School and joint lecturer on biology. In 1915 Earle was appointed professor of physiology in the University of Hong Kong and was for some years Dean of the Faculty of Medicine ; the University conferred on him the honorary degree of LL.D. when he resigned his chair in 1927 to become director of the Henry Lester Institute at Shanghai. He published a number of papers in this and other journals on the physiology and pathology of the pancreas and on basal metabolism, and took a keen interest in the assessment of physical fitness and physiological anthropometry. His observations on the basal metabolism of Chinese students were presented to the XIIth International Congress of Physiology, held at Stockholm in 1926.

Earle joined the B.M.A. in 1914 and was president of the Hong Kong and China Branch in 1919 ; he had also been chairman of the Research Council of the Chinese Medical Association for eight years and served on a number of other scientific councils and committees. He acted as delegate from China at the Congress of British Universities on three occasions—Oxford 1921, Cambridge 1926, and Edinburgh 1931.

Dr. JAMES L. MAXWELL, C.B.E., writes:

The death of Dr. H. G. Earle is a serious loss to scientific research in medicine in China. Some 18 years ago, when Earle already occupied an outstanding position as professor of physiology in the University of Hong Kong, he received a very pressing invitation to accept the appointment as director of the Henry Lester Institute of Medical Research in Shanghai. The institute was then in the process of development, and it was essential for its success that a director be chosen who was outstanding in his profession, a good organizer, and one who could hold the confidence alike of his British and Chinese staff. The choice fell unanimously on Earle, and his appointment proved a success in every way.

Dr. Earle suffered internment at the hands of the Japanese when Shanghai was seized, and the long confinement, under very adverse conditions, seriously undermined his health. Dr. Earle was regarded, alike for his personal and professional qualifications, with genuine affection by Chinese and foreign friends in Shanghai and throughout China, and was greatly esteemed for his outstanding Christian profession. His loss to the cause of scientific progress in medicine in China is a very serious one.

The death of Mrs. RENNIE MACINNES, M.B.Lond., means the loss of a friend to many, not only at home but in Palestine, where as wife of a former Anglican Bishop in Jerusalem she was for many years a prominent figure, noted for her practical interest in religious and social activities. Janet MacInnes spent her early married life in Cairo, where her husband was then a missionary. Before the end of the first world war she moved to Jerusalem and assisted Bishop MacInnes in the work of the Syria and Palestine Relief Fund. In addition to this work for the victims of war and famine, she engaged for many years in practical efforts for the amelioration of conditions for women and girls, assisting the Government welfare worker in combating the many social evils which were found in Palestine. In this her medical knowledge (she had qualified in 1899) proved an asset. In the early days of the Palestine mandate she helped to create a voluntary society of women of different races and creeds, which opened a rescue home and inaugurated other social services, later to be taken over by the Government. Mrs. MacInnes was an attractive speaker and much in demand as a chairman. After the Bishop's death in 1931 she became secretary of the Palestine Mission of the Church Missionary Society. People of all kinds turned to her in perplexity and gained benefit. In spite of multifarious activities she seemed to have a reserve of strength which made her serene and unhurried.

Dr. WILLIAM ROBERT JAMES GARSON, who died recently at the age of 87, was for many years one of the best-known practitioners in Wirral and had been a member of the B.M.A. since 1881. When he retired from the post of medical officer to the Wirral Joint Hospital Board tributes to his long and valuable service were paid and he was appointed honorary consultant. He studied medicine at the University of Edinburgh, graduating M.B., C.M. in 1880, and some of his undergraduate years at Edinburgh were spent while Lord Lister was there. He knew intimately and hero-worshipped Henry Drummond, who stayed with him for fishing holidays in the Orkneys when he was a boy, and he later met Drummond when he used to lecture to the students in Edinburgh and Glasgow. After recovering from typhus in an epidemic in Newcastle-upon-Tyne, where he worked in "The Dispensary," and at the Ear and Throat Hospital Dr. Garson settled in practice at Bebington, Cheshire, retiring in 1943 after 60 years in practice. He was medical officer to the Wirral Fever Hospital from the time when it began work. He leaves four sons and one daughter. Two sons are medical men—Mr. Philip Garson, F.R.C.S.Ed., of Liverpool, and Dr. H. L. Garson, who is a general practitioner at Bromborough and was a brigadier in the recent war. His daughter married the late Dr. H. B. Weir, the London pathologist who used to assist Sir Bernard Spilsbury.

Medical Notes in Parliament

HEALTH SERVICE BILL

Before the Standing Committee adjourned on June 6 four further clauses of the Health Service Bill were examined. Mr. PIRATIN, on Clause 22, moved that arrangements under the Clause should include the provision of day and residential nursery accommodation. Mr. SOMERVILLE HASTINGS supported the amendment. Mr. BEVAN said he intended, when asking local authorities to plan their schemes, to make provision for day nurseries, but it was not practicable to do this everywhere. The demand for these nurseries varied enormously, and in some the overhead charges were very heavy for looking after a small number of infants. The amendment was defeated by 32 to 1.

In the same Clause Capt. BAIRD moved to add that it should be the duty of every local health authority to arrange for the dental care of persons who had reached compulsory school age but had not attained the age of 18. Mr. BEVAN replied that this matter was already sufficiently covered. What was really limiting was the number of dental surgeons. It was no good providing under the Bill for more dental care when this would be limited by the number of dentists. The amendment was withdrawn.

Mr. BEVAN accepted an amendment allowing a local authority to make contributions to a voluntary association which cared for children under 4 years of age but did not concern itself with expectant mothers. Answering a question by Mr. Reid about the charges which, under subsection 2 of the Clause, local authorities could recover, Mr. BEVAN said the scale of such charges would be known and had to be approved by the Minister before it became the scale on which the local authorities could recover. The services could not be provided without the means of the people concerned being considered. There would have to be a means test. The Clause as amended was added to the Bill.

On Clause 23 Cmdr. GALBRAITH remarked that subsection 3 appeared to give power to local authorities to lay down the qualifications of medical practitioners. Mr. BEVAN replied that was not for the local authorities to decide. A definition of what was a specialist, or a person with special qualifications, would be decided before long on the advice of the profession. The Clause was ordered to stand part of the Bill.

Mr. MESSER, on Clause 24, said the National Association for the Prevention of Tuberculosis was concerned about what would happen to specially trained visitors under the Bill. Mr. BEVAN said it was proposed that the Regional Boards should employ the health visitors of the local authorities, and a link would thus be established between them. The Clause was ordered to stand part of the Bill.

"DISTRICT" NURSING

On Clause 25, which deals with home nursing, Mr. REID moved an amendment in order to raise the question whether the local health authority should set up its own organization of nurses employed by it, and also whether this type of nursing should be limited to nurses who had received a special course of training. He said home nursing differed in many ways from nursing in a hospital. He hoped Mr. Bevan would do nothing

to supersede the good organization which at present employed these nurses all over the country. Mr. BEVAN said it was in the interest of that excellent organization that the words of the Clause should be unaltered. They left the local authority free to employ a suitable voluntary organization or to employ nurses itself. Local authorities, in the plans submitted, would have to satisfy the Minister that they were making considerable use of the voluntary organizations available.

Mr. Reid withdrew his amendment and Clause 25 was added to the Bill.

The Committee adjourned till June 18.

The General Medical Council

On June 7, during the debate on the motion for the Whitsuntide adjournment, Dr. MORGAN intervened to draw attention to the judicial tribunal which governed the conduct of the medical profession. He said this body could make its own crimes and misdemeanours but could inflict only one sentence. That tribunal was the General Medical Council.

Mr. Keeling and Mr. Callaghan protested at Dr. Morgan interposing this subject.

Continuing, Dr. Morgan said the G.M.C. was an undemocratic body with only seven elected members out of 42. The procedure was unlike that of any other tribunal in this country. The G.M.C. made its own procedure. It decided what was evidence; it could decide to discard evidence or to insist on cross-examination on evidence which the tribunal had not heard orally. Members who heard the original complaint and decided that there should be a trial also sat in judgment on the accused. He was allowed to be represented by counsel. The G.M.C. had a legal assessor. That assessor had the right to cross-examine the accused person while, so far as was known, counsel for the accused person had no right to cross-examine other witnesses. This degraded form of topsy-turvy justice had existed for 100 years without a change. The G.M.C. was a prejudiced partisan body. Dr. Morgan said he had counsel's opinion showing that evidence given before the tribunal need not be sworn. It might be written and not declared in open court. There need not be cross-examination. Every possible obstacle to an accused's being able to state his case was put in front of him. Dr. Morgan then alluded to the recent case of Dr. Hennessy. He said he did not ask for legislation, but for an inquiry by a Royal Commission, a Select Committee, or other means. He asked that the procedure of the G.M.C. should be changed and reformed, but that this should not be done in private within the profession. Doctors had had 100 years to reform the G.M.C. and had not done so. Gentlemen who had the highest degrees in medicine and whose personal character was, as a rule, unassailable would perpetrate injustices of the most despicable kind against their colleagues even when the evidence could not be used to condemn the worst criminal. The legal assessor, when summing up for the council, did not advise in public but *in camera*. The legal assessor cross-examined the respondent but not the complainant. The respondent had no right of appeal to the High Court. The case could be reopened only by the G.M.C. The only sentence it could impose was one of erasure. It could indulge in the mental torture of postponed sentence for a year or for six months. The anaesthetist of Sir Herbert Barker was struck off the roll, but the G.M.C. did not say anything to specialists who attended a demonstration by Sir Herbert Barker in one of the teaching schools. Dr. Hennessy had to fight alone because, when erased, he lost his membership of the Medical Defence Union. Dr. Morgan challenged the Labour Government not to allow the medical profession to hold its own investigations.

Mr. KEY said Mr. Herbert Morrison had asked him to reply. It had, Mr. Key remarked, been definitely accepted that some reform of the Medical Acts was necessary and the Goodenough Interdepartmental Committee had made certain recommendations on the point. The G.M.C. itself had been considering the question for some 18 months, and was going forward with certain proposals. The Government intended, if time could be secured in the coming session, to put forward its own proposals, and that a medical Bill should be introduced.

The DEPUTY SPEAKER said Mr. Key was not entitled in the debate to deal with legislation.

Mr. KEY said the Government regarded an inquiry as inappropriate because it had already settled that the matter should be dealt with adequately and properly. The Government wished to study the information which had been provided and to consult with the profession and the people interested. The points which Dr. Morgan had raised would be borne in mind. It would be unfortunate if the impression got about that it was a general thing that members of the medical profession could be struck off the *Register* arbitrarily for some slight offence. The G.M.C. could work only within the powers conferred on it by Parliament. In general the council discharged its disciplinary functions ably and carefully and with a sense of grave responsibility. That there was no appeal against its decisions was not the responsibility of the G.M.C. Criticism had been made of the constitution of the G.M.C.; on that he could say nothing regarding the proposals of the Government. Due consideration would be given before the proposals were put before Parliament.

E.M.S. Hospitals

Mr. KEY told Dr. Segal on June 6 that most E.M.S. beds had been beds reserved in the country's ordinary hospitals, supplemented by additional accommodation. As E.M.S. reservations diminished, the beds were normally left available for ordinary use. Reservations were 47,344 on Dec. 31 last and 35,000 at May 31. They would go on diminishing. The Ministry of Health would take every step to prevent premature closing of hospital beds. The difficulty was not so much availability of beds as of staff.

Mr. BEVAN told Dr. Segal on June 6 that the Leatherhead Emergency Hospital would be closed before the end of this year. The residual cases would be pensioners for whom the Ministry of Pensions would accept responsibility.

Emergency Hospitals in Scotland

Mr. MCKINLAY on June 4 asked for a statement regarding the future of the emergency hospitals built during the war and administered by the Department of Health for Scotland. Mr. WESTWOOD answered that these hospitals, although intended originally for air-raid casualties, had treated large numbers of patients who were in the Services or auxiliary organizations or who became the responsibility of the Ministry of Pensions. The numbers of patients in these classes were falling, but were still substantial and must be regarded as a first commitment. Certain classes of civilian patients had already been admitted. He proposed to extend the arrangements for the admission of such patients in order that the hospitals and the special facilities they provided might serve the people of Scotland as a whole. The extent to which they could do so depended primarily on the numbers of medical, nursing, and other staff available. He hoped the existing staffs, including members of the Civil Nursing Reserve, would continue on the new basis. The new arrangements would take some time to bring into full effect, but before the National Health Service came into operation these hospitals should have found their proper place in the permanent hospital system of Scotland.

Specialists in the R.A.M.C.

Major LLOYD asked on June 4 whether Mr. Lawson knew that at Aug. 31 specialists of the R.A.M.C. would be 15 groups behind other medical officers and two groups behind other ranks in release. Mr. LAWSON replied that specialists were generally older than other medical officers on entry into the Army, and there was, therefore, a far larger proportion of specialists in the early age-and-service groups. This made it inevitable that their release programme should fall behind that for general duty medical officers. Specialists were being released as rapidly as the requirements of the Army allowed, and about 70% of those serving in June, 1945, had already been released. In the interests of serving soldiers he could not allow any serious deterioration in specialist services. To assist in meeting the Army's requirements specialists would in future be accepted on an eighteen-months engagement. He hoped that this would increase the intake from civil life.

Sir E. GRAHAM-LITTLE on June 6 asked whether Mr. Lawson was aware that there was a waste of specialist surgical experience in the R.A.M.C. An example furnished to him in the India Command was of a London graduate holding the qualifications M.S., F.R.C.S. assigned to duties within the capabilities of a G.D.O. Mr. LAWSON said every effort was being made in India and elsewhere to economize in specialist establishments wherever possible, but difficulties were presented by the fact that units were scattered over large distances and might require specialist assistance at short notice. He was inquiring into the specific case of alleged waste of specialist skill of which Sir Ernest had sent particulars.

Free Hearing Aid

In the House of Lords on June 5 Lord WALKDEN announced that a new hearing aid would be manufactured as a Government monopoly and distributed free to all who needed it through the National Health Service. The Medical Research Council had evolved a hearing aid which was believed to be an improvement on anything known before. Free issue was

expected to begin in 1948. Until then it would be provided at cost price, about £10, through the hospitals. Free maintenance, servicing, and new batteries would be available except in cases of damage through the patient's own carelessness. The Electrical Acoustics Committee had also recommended approved equipment for testing the degree of deafness. This would be supplied to clinics free of charge.

Vaccination and Inoculation.—Mr. LAWSON told Mr. Braddock on June 4 that Army instructions issued on Feb. 20 stated that inoculation and vaccination were voluntary. Mr. Lawson believed this was well known throughout the Army. These instructions referred to Service personnel and their families. The question of the inoculation and vaccination of families proceeding over-seas was under discussion. Difficulties arose because it was laid down by some foreign countries that vaccination and inoculation certificates must be produced as a condition of entry into the country concerned. Present instructions therefore stated that certain types of vaccination and inoculation must be carried out before passage could be allowed.

Extra Food Allowances—Mr. STRACHEY stated on June 5 that a list of the conditions for which extra foods were allowed had been circulated to all registered medical practitioners. He added that it would not be in the general interest to publish this information. The medical advisers of the Ministry of Food were strongly against publication, but he would look into the matter again. Hunger, Mr. Strachey remarked, was not a disease.

Notes in Brief

Patients suffering from infectious diseases such as measles and scarlet fever, when isolated at home, are entitled to an extra soap ration if confined entirely to bed for a period longer than one month.

In Tanganyika 5,372 cases of sleeping sickness were reported during the years 1936 to 1945 inclusive, of which 2,527 were fatal. Of 86 cases reported up to the end of April this year, 16 were fatal.

At May 13, 31,612 vacancies were notified to the Ministry of Labour for all grades of nurses and midwives.

The committee considering the future of the x-ray industry includes Mr. Warburton, lately Director of Medical Supplies, Ministry of Supply (chairman), Brig. McGrigor, consultant radiologist to the War Office, and Dr. Russell Reynolds, radiologist.

The Services

Dr. William Evans has been appointed consulting cardiologist to the Royal Navy.

The following appointments and mention in dispatches have been announced in recognition of gallant and distinguished services while prisoners of war:

C.B.E. (*Military Division*).—Col. (Acting) J. Taylor, O.B.E., R.A.M.C.

O.B.E. (*Military Division*).—Col. C. O. Shackleton, late R.A.M.C.; Lieut.-Cols. D. C. Bowie and L. R. S. MacFarlane; Lieut.-Cols. (Temp.) J. C. Collins and C. W. Maisey, R.A.M.C.

M.B.E. (*Military Division*).—Majors G. F. Harrison, A. C. King, and R. Ramsay; Majors (Temp.) H. M. S. G. Beadnell, F. J. Murray, M. T. Read, M.C., and E. C. Vardy; Major (Acting) P. R. Graves; Capts. G. Blair, K. P. Brown, F. E. de W. Cayley, A. H. R. Coombes, R. L. Lancaster, J. Markowitz, K. C. Matheson, J. C. McNeilly, C. C. Petrovsky, T. S. Protheroe, A. Roy, P. G. Seed, H. E. De-Wardener, R. D. Taylor, and A. J. N. Warrack, R.A.M.C.

Mentioned in Dispatches.—Major (Temp.) J. D. Fraser, R.A.M.C.

The following appointments and mentions have been announced in recognition of gallant and distinguished services in the field:

O.B.E. (*Military Division*).—Major F. P. H. E. Orban, R.A.M.C.

M.B.E. (*Military Division*).—Major (Temp.) S. N. Varian, R.A.M.C.

Mentioned in Dispatches.—Major (Temp.) D. D. A. Fraser and Capt. D. R. Macauley, R.A.M.C.

The following appointments, awards, and mention in dispatches have been announced in recognition of gallant and distinguished services in Burma:

C.B. (*Military Division*).—Major-Gen. (Acting) W. E. Tyndall, C.B.E., M.C., late R.A.M.C.

C.B.E. (*Military Division*).—Brigs. (Local) J. C. Hawksley, H. L. Marriott, and M. F. Nicholls; Brig. (Temp.) G. E. Macalevey, D.S.O., M.C.; Brig. (Acting) A. Swindale, O.B.E., T.D.; Col. (Temp.) J. J. O'Dwyer, R.A.M.C., Brig. (Local) M. K. Alfridi, O.B.E., I.M.S.

O.B.E. (*Military Division*).—Lieut.-Col. (Temp.) D. J. Lawless, W. C. Mitchell, C. E. Moorhead, H. G. Page, M.B.E., W. Serle, and W. G. Sutcliffe, R.A.M.C. Col. (Temp.) J. L. Mewton; Lieut.-Cols. (Temp.) S. M. Basu, A. S. Rao, F. W. Snedden, and B. P. Srivastava, I.M.S. Col. (Acting) A. L. Craddock, M.B.E., Army in Burma Reserve of Officers.

M.B.E. (*Military Division*).—Majors (Temp.) A. B. Cook, B. H. Ellis, N. S. Martin, W. Minns, J. McD. Simpson, W. T. Walker, D. B. Watson, and J. D. Younghusband; Major (Acting) H. D. Thompson; Capts. H. Acton and M. F. Ronayne, R.A.M.C. Majors (Temp.) S. Prakash and S. D. Singh; Capts. Hafiz-ur-Rahman and S. B. H. Gardezi, I.M.S. Majors (Temp.) S. F. Thomas and C. J. Todd; Capts. B. Singh and B. M. R. Choudhury; Capt. (Acting) V. P. Batra; Subadar C. Mani, I.A.M.C.

M.C.—Major (Temp.) J. Jacobs; Capts. D. R. Evans and G. H. Pimblett, R.A.M.C. Capts. H. N. Roy and S. A. Wadud, I.M.S.

Mentioned in Dispatches.—Capt. B. Bernstein, R.C.A.M.C.

The following appointments and mentions in dispatches have been announced for distinguished service during the war in the Far East:

M.B.E. (*Military Division*).—Temp. Surg. Lieuts. T. W. G. Kinnear, S.A.N.F.(V.) and I. F. K. Muir, R.N.V.R.

Mentioned in Dispatches.—Surg. Cmdr. D. F. Walsh and Surg. Lieut.-Cmdr. E. B. Bradbury, R.N., Acting Surg. Cmdr. R. D. Bradshaw, Surg. Lieut.-Cmdr. W. P. G. Dickson, Temp. Acting Surg. Lieut.-Cmdr. J. Watt, and Temp. Surg. Lieuts. R. D. Maclean, I. S. Bergius, R. R. H. Lovell, and B. J. Webb, R.N.V.R.

Medical News

The annual general meeting of the Paddington Medical Society will be held at St. Mary's Hospital, W., on Tuesday, June 25, at 8.45 p.m., when films on gas-air analgesia in midwifery and on the production and distribution of medical gases will be shown.

A meeting of the Medical Society of the L.C.C. will be held at County Hall, S.E., on Wednesday, June 26, at 4.30 p.m., when Mr. W. Ritchie Young will open a discussion on "Dental Disease in its Relation to Ill-health."

The annual general meeting of the British Empire Leprosy Relief Association will be held at the India Office, Whitehall, at 3 p.m., on Wednesday, June 26, when addresses will be given by Sir Bernard Bourdillon, chairman of the executive committee, and Dr. T. E. Davey, medical superintendent of the Uzuakoli Leper Settlement in S.E. Nigeria.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, June 27, at 8.15 p.m., when a paper will be read by Mr. T. Paterson Owens on "Approved Schools and Remand Homes."

The annual meeting of the Royal Society of Medicine will be held on Tuesday, July 2, at 1.30 p.m., when diplomas of Honorary Fellowship will be presented to Group Capt. Antoni Fiumei, late D.G.M.S., Polish Forces, and Col. Carel Frederick Koch, late D.G.M.S., Netherlands Forces, and the officers and council of the society for 1946–7 will be elected.

A final programme has now been issued for the National Conference on Maternity and Child Welfare to be held at Friends House, Euston Road, N.W., on Thursday and Friday, June 27 and 28. There are three main subjects for discussion: (1) planning a home, making a home, running a home; (2) incidence of dental disease and the care of the teeth of expectant and nursing mothers and children under 5 years; (3) care and treatment of the handicapped child. There will also be a show of films dealing with the care of the teeth. Dr. Jane H. Turnbull, chairman of the National Association of Maternity and Child Welfare Centres and for the Prevention of Infant Mortality, will open the conference at 10.30 a.m. on June 27. Mr. Aneurin Bevan, Minister of Health, will give his presidential address on June 28 at 10.30 a.m. Tickets (10s. 6d. each for two days, 6s. each for one day, or one session) may be had from the secretary, Miss M. R. Lovelock, 117, Piccadiliy, W.1.

A Swiss doctor is offering free board and lodging to an English male student for three months beginning July 1. The student should be studying medicine or natural science, 22 years of age or older. If possible he should be a research worker or studying for a higher degree. For full details apply to the Secretary, British Medical Students Association, B.M.A. House, Tavistock Square, London, W.C.1.

A new and revised list of the names and addresses of all members of the British Institute of Radiology is very shortly to be published. Members are asked to take immediate steps to let the Institute know their present permanent address should this differ from that published in the yearbook for the session 1943–4. They should write to 32, Welbeck Street, London, W.1.

A notice was published in the *London* and *Edinburgh Gazettes* dated June 14, 1946, of the Secretary of State's intention to make Rules amending the Poisons Rules, 1935, and an Order amending the Poisons List. Copies of the proposed amending Rules and Order may be obtained from H.M. Stationery Office or through any bookseller, price 2d. and 1d. respectively.

Dr. Cyril Burt, professor of psychology at University College, London, received a Knighthood in the Birthday Honours List.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on June 3 the following medical degrees were conferred:

M.D.—J. N. Mills (by incorporation), J. Metcalf, R. L. Lancaster, S. C. Truelove.
M.CHIR.—A. G. Leacock (by proxy).
M.B., B.CHIR.—J. G. Benstead, F. J. Conway.

UNIVERSITY OF LONDON

Sir Edward Peacock will present the prizes at the London Hospital Medical College in the Library on Thursday, June 27, at 3 p.m.

The Senate has decided to confer the honorary degree of D.Sc. on Prof. E. D. Adrian, O.M., M.D., F.R.S., F.R.C.P., and Sir Henry Dale, O.M., G.B.E., M.D., F.R.S., F.R.C.P., at a ceremony in November next, in connexion with the celebration of Foundation Day.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council, held on June 14, M. F. A. Woodruff, M.D., M.S., was appointed full-time tutor in surgery. The Council received the resignation of Dr. C. E. Davies of the post of part-time assistant tutor in medicine, and thanked him for his services.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The President and members of the Council entertained to dinner at the College on June 11 various oversea delegates to the Imperial Press Conference.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* there were 644 more cases of measles than in the preceding week. The only other changes were decreases in diphtheria 67, and dysentery 37.

The largest variations in the returns for whooping-cough were increases in Carmarthenshire 31 and Essex 25, and a decrease in Staffordshire 43. Only 304 cases of diphtheria were notified—the smallest ever recorded; the largest decreases were Yorkshire West Riding 22, Durham 18, and Lancashire 11. In contrast to the general trend of diphtheria an increase of 17 was recorded in London.

The rise in measles was mainly confined to the counties surrounding London, though the incidence in London decreased by 67. The largest increases were Middlesex 144, Lancashire 131, Essex 90, Kent 54, Surrey 52, and Hertfordshire 43. Anglesey had 66 more cases in an outbreak which began last week with 101 cases.

The only new outbreak of dysentery was in Kent (Malling R.D. 17 and Cranbrook R.D. 11). Other large returns were Lancashire 28, London 15, and Warwickshire 11.

In *Scotland* rises occurred in the notifications of scarlet fever 33, whooping-cough 23, and diphtheria 12. The increase in scarlet fever was mainly contributed by Glasgow, where the notifications rose from 47 to 68. The largest rises in diphtheria were Glasgow 7 and Edinburgh 6.

In *Eire* the only changes were increases in measles 54, and scarlet fever 13. The rise in scarlet fever was general, while the rise in measles was mainly due to an outbreak in Wicklow, Rathdrum R.D. 40.

Quarterly Returns for Scotland

During the March quarter the births were equivalent to a rate of 18.1 per 1,000, which was 0.5 above the average of the five preceding first quarters. Infant mortality was 69 per 1,000 registered live births and was 15 below the five-years average. The general death rate was 16.3 per 1,000, being 0.1 below the average for the five preceding March quarters. The death rate from all forms of tuberculosis was 82 per 100,000, and from respiratory tuberculosis 66; these rates were 8 and 3, respectively, below the five-years average. Deaths from epidemic diseases included diphtheria 40, cerebrospinal fever 32, whooping-cough 24, and measles 19.

Week Ending June 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 987, whooping-cough 1,749, diphtheria 304, measles 3,896, acute pneumonia 546, cerebrospinal fever 47, dysentery 149, poliomyelitis 9, paratyphoid 2, typhoid 4, smallpox 3.

No. 22

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 1.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1946					1945 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	54	8	33	—	—	44	9	22	2	—
Deaths		—	—				3	—	—	
Diphtheria	304	43	86	38	8	436	20	106	108	18
Deaths	2	—	—	1	—	11	—	3	1	—
Dysentery	163	15	46	—	—	458	37	155	1	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	2	—	—	—	1	2	—	—	—	—
Deaths		—					—			
Erysipelas			40	10	3			42	8	
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				27					35	
Deaths	35	1	11	5	3	50	8	11	15	2
Measles*	3,931	967	640	78	5	10,455	508	410	64	3
Deaths	4	2	1	—	—	2	—	—	—	—
Ophthalmia neonatorum	64	4	23	—	—	72	7	20	1	—
Deaths										
Paratyphoid fever	—	—	—	—	—	8	1	9 (B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	596	43	3	5	3	486	21	4	10	2
Deaths (from influenza)†	13	3	2	—	3	5	—	—	—	—
Pneumonia, primary		32	228	32			23	184	19	
Deaths				6	7				14	7
Polio-encephalitis, acute	1	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	9	1	1	5	—	3	—	—	—	—
Deaths		—					—			
Puerperal fever		1	20		—		2	6		—
Deaths										
Puerperal pyrexia‡	135	8	10	3	—	104	5	8	—	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,070	88	176	31	30	1,233	45	239	21	32
Deaths	1	—	1	—	—	2	—	—	—	—
Smallpox	2	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	—	4	4	2	8	2	—	3	—
Deaths	—	—	—	—	—	—	—	—	—	1
Typhus fever	—	—	—	—	—	3	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	2,059	193	92	30	16	982	45	129	24	16
Deaths	10	2	3	1	—	4	—	1	—	—
Deaths (0–1 year)	321	46	63	25	12	329	48	47	42	21
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,336	678	615	194	126	4,019	566	526	211	128
Annual death rate (per 1,000 persons living)			13·5	12·4				11·9	13·6	
Live births	8,438	1273	1009	444	283	7,043	727	925	451	260
Annual rate per 1,000 persons living			20·3	28·4				18·5	29·1	
Stillbirths	264	33	29			253	31	29		
Rate per 1,000 total births (including stillborn)			28					30		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

Letters, Notes, and Answers

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ANY QUESTIONS?

Sycosis Barbae

Q.—*How does one prepare an autogenous vaccine for sycosis barbae? How long does this take and how much would it cost?*

A.—The stages in the preparation of an autogenous vaccine are the making of a primary culture, thence of a pure culture if necessary, the suspension of the growth in 0.5% phenol saline and its sterilization by heat, a test for sterility, and dispensing in ampoules or bottles. The whole process need not occupy more than three or four days unless the organism is of exceptionally slow growth, and this would not be so in the present case, since sycosis barbae is due to one of the most freely growing of common bacteria—*Staphylococcus aureus*. The preparation of such vaccines is undertaken by all practising clinical pathologists and laboratories who engage in work for fees; charges vary widely, but a reasonable fee would be between two and a half and five guineas.

The treatment of sycosis barbae with an autogenous vaccine alone is not usually successful. Penicillin in the form of a cream or spray has given excellent results in some cases, although relapse may follow. A test of the sensitivity of the staphylococcus to penicillin is advisable before this treatment is begun.

Artificial Pneumoperitoneum

Q.—*Please describe the technique, results, and dangers of artificial pneumoperitoneum.*

A.—This question is difficult to answer briefly. Artificial pneumoperitoneum has been used in the treatment of certain cases of mainly unilateral pulmonary tuberculosis in which artificial pneumothorax is either impossible because of adhesions or regarded as dangerous because of the acuteness of the disease and the consequent liability to pleural effusion or empyema. It is customarily combined with temporary or permanent phrenic nerve interruption, and its effect is to reinforce the rise of the diaphragm produced by this procedure. The puncture is usually made through the anterior abdominal wall, a little below the costal margin and just lateral to the rectus abdominis muscle. After the pneumoperitoneum has become established, refills may be more conveniently given through one of the lowest intercostal spaces in the flank. At the induction, and sometimes at the refills, no reading of pressure is obtained before the air is introduced, and the finding of the space is therefore a matter of skill and experience. The quantities of air usually introduced are much higher than in artificial pneumothorax, and average about 800 to 1,000 ml. When the pneumoperitoneum is established this quantity may be required at intervals of a week to a fortnight. The dangers of the procedure include air embolism, which does not appear to be more frequent than with artificial pneumothorax, and peritoneal effusion and tuberculous peritonitis, which are very much less common than the corresponding affections of the pleura in artificial pneumothorax. In addition, less serious complications, such as discomfort and dyspepsia from abdominal distension, and the production of inguinal and other hernias which may contain air, have been recorded.

So far as the results are concerned, the procedure is a relatively recently introduced one about which no agreed opinion has been reached. Some authorities have gone so far as to claim that the results obtained have been so favourable, and the complications so few, that they recommend pneumoperitoneum even in cases which are suitable for artificial pneumothorax. Others feel that the procedure has certain limited indications—for instance, for the treatment of cavitating lesions situated in the lower lobe, especially in its dorsal segment, or in the treatment of acute pneumonic tuberculosis. In these latter cases a combination of phrenic nerve interruption and artificial pneumoperitoneum may tide the patient over the acute stage of the disease and enable an artificial pneumothorax, which would be dangerous at the onset on account of the risk of pleural complications, to be induced safely later on. Others are more sceptical still and regard pneumoperitoneum merely as a means of reinforcing the effect of, and having the same rather limited indications as, phrenic nerve interruption.

Remissions in Peptic Ulcer

Q.—*What is the explanation of remissions in peptic ulcer? Why are these remissions usually so regular in their periodicity in any one case?*

A.—In the present state of knowledge it is not possible to express dogmatically the reasons for remissions in cases of peptic ulcer. It must always be remembered that peptic ulcer may be present without symptoms. A huge ulcer becomes symptomless after treatment for a few days and, similarly, many patients adopt treatment only when pain recurs. In many cases, if not in all, "remissions" are merely the result of treatment, which the patient half-consciously adopts when pain returns.

Brow Presentation

Q.—*Is Caesarean section the best treatment for brow presentations?*

A.—The treatment of brow presentation naturally varies with its cause and other circumstances of the case. Thus, if the cause is a pelvic deformity there is little question that Caesarean section is the best treatment. The same is usually true when the patient is a primigravida. Sometimes, however, in multiparous patients there is a place for other lines of treatment, such as internal version. It is impossible to lay down a general rule, but there is no doubt that there has been an increased use of Caesarean section in these cases during recent years. This is largely on account of the adoption of the lower-segment technique, which can be carried out with reasonable safety for the mother, even when labour has been prolonged, and which offers the best chance to the child.

Benzyl Benzoate in Pregnancy

Q.—*Is there any evidence for the statement that benzyl benzoate causes abortion in scabetic expectant mothers?*

A.—There is no evidence that benzyl benzoate treatment for scabies has any effect on expectant mothers. The correct treatment is to give one application, which is left for twenty-four hours and then washed off in a bath. If necessary, and only if necessary, a second application is made one week later. Some doctors, however, do not realize that one application, or at most two, is sufficient treatment, and they give several applications, which causes dermatitis. This is certainly bad for anyone, including expectant mothers. Otherwise there is no connexion whatever between the treatment and the uterus.

Disorders of Calcium and Phosphorus Metabolism

Q.—*What are the modern views regarding the relationship of blood calcium levels, blood phosphorus levels, and the calcium–phosphorus ratio, to (a) the muscular twitchings of uraemia, (b) infantile spasmophilia, (c) hypoparathyroidism, and (d) the clinical state of "alkalosis"?*

A.—In uraemia the serum calcium falls to extremely low levels (5 mg. per 100 ml. and less), the phosphate at the same time rising greatly, and the increased muscular irritability may reasonably be attributed to this reduction in calcium. In alkalosis, on the other hand, whether due to hyperpnoea, vomiting, or overdosage with alkalis, the level of the serum calcium is normal; but it is believed that owing to the change in reaction towards increased alkalinity a reduction in ionized active calcium occurs. Tetany is seen especially in the hyperpnoeic type and is relatively rare in overdosage. In hypoparathyroidism

the serum calcium shows a gross reduction and there is a considerable rise in the serum phosphate, to a level of 6 or 7 mg. per 100 ml. (normal 3 to 4 mg.). The primary disturbance would seem to be a fall in the excretion of phosphate by the kidney. Tetany appears with the fall in calcium, and can be relieved by the administration of calcium orally or by the parenteral route, or by raising the serum calcium by injection of parathormone or by very large doses of vitamin D. In infantile spasmophilia appearing in connexion with rickets the calcium is also reduced, owing to defective absorption. Though the primary blood change in human rickets is a fall in the phosphate, believed by some to be due to overaction by the parathyroids in an attempt to compensate for the reduction in absorbed calcium, later the serum calcium may also fall and spasmophilic symptoms appear.

Mycosis Fungoides

Q.—*An unmarried woman of 37 has been suffering for the last seven years from mycosis fungoides. Is any treatment likely to effect improvement at this stage?*

A.—Mycosis fungoides, like the leukaemias and Hodgkin's disease, is one of the reticulo-endothelioses; and, though sometimes responsive to natural or artificial shock therapy, in the majority of cases it is controlled only by radiotherapy. Presuming that the blood picture and sternal puncture reveal no abnormality in white cells and that clinical and *x*-ray investigation show no infiltrations in lungs or viscera, *x*-ray therapy should be given in small dosage (150 *r* units, unfiltered, at about 90 kV) to the whole body, and should be repeated every three or four weeks until the condition is controlled, the treatment being resumed if there is a relapse. A watch must be kept for the possibility of damage to blood-forming organs. In most cases a point is ultimately reached where the condition becomes unresponsive, and then there is little more that can be done. Internal treatment and local applications are of no avail.

Dermatitis in Concrete Workers

Q.—*Please discuss the cause, treatment, and prevention of dermatitis contracted in the concrete industry (wet and dry processes).*

A.—Dermatitis in this industry may be caused (1) by contact with cement, sand, and lime, with or without friction, or (2) from oiling or cleaning moulds. Measures for prevention are on the lines generally advocated—viz., selection of workers and their protection at work; supervision and inspection to detect early cases of skin irritation and to ensure cleanliness. Amplification of the scope of these preventive measures is given in F.330 issued by the Factory Department of the Ministry of Labour and National Service, obtainable from H.M. Stationery Office. Treatment of cases of dermatitis in the concrete industry differs in no way from that from other industrial causes.

References to literature include the following: H. P. Brinton and L. Schwartz (*Industr. Med.*, 1945, **14**, 617); P. Derville and P. Carrère (*Méd. du Travail*, 1935, **7**, 244); W. Burckhardt (*Schweiz. med. Wschr.*, 1938, **68**, 783, and *Arch. f. Derm. u. Syph.*, 1938, **178**, 1); J. G. Downing (*Arch. Derm. Syph.*, Chicago, 1939, **39**, 12); L. Schwartz and L. Tulipan (*Occupational Diseases of the Skin*, 1939, p. 128, Philadelphia).

Subacute Combined Degeneration

Q.—*A man of 51 has had pernicious anaemia for fifteen years, and for three years has received doses of liver extract. The symptoms of subacute combined degeneration have improved under treatment. His blood count is now 5 millions and his colour index 1.16. Is it wise to continue with 4 ml. of liver extract weekly?*

A.—There is a good case for continuing with big doses of liver extract. Spinal degeneration responds only to unusually large amounts. There is some clinical support for the employment of vitamin preparations at the same time, and especially injections of B_1. One would be wise in also prescribing by mouth whole liver, liver extract, and desiccated hog's stomach. Polycythaemia is the most usual complication of excessive liver dosage, and can be detected by periodic red cell counts. Sensitivity to liver extract is not likely to develop later in the course of treatment.

After-effects of Undulant Fever

Q.—*Is there any useful treatment for the lassitude, arthralgia, myalgia, and fibrositis which still persist four years after undulant fever? Is it permissible to take amphetamine?*

A.—No particular line of treatment for the pains described can be recommended with confidence. It would be worth while to make a meticulous search for one of the commoner sources of chronic infection which might be associated with chronic fibrositic pain, to investigate the possibility of some nutritional defect, or of degeneration or infection of the central or peripheral nervous system, and to exclude any abnormal vascular condition. The routine and prolonged use of amphetamine is not recommended, because of its occasional side-effects, the possibility of developing addiction, and its failure to remove the fundamental cause of lassitude. Chronic lassitude is usually infective or psychological in origin, and treatment should be directed at the cause.

INCOME TAX

Medical Officer: Car Expenses

J. M. bought a car on April 3, 1946, while seeking an assistantship. Shortly afterwards he accepted an engagement as medical officer to an industrial concern. The firm would supply the use of a car if J. M. didn't possess one. Can he claim a deduction for the use of his car?

*** The rule is a rigid one: to be allowable an expense must be incurred wholly, exclusively, and necessarily in the performance of the duties of the office. If the facts are that J. M. can at any time call for the use of one of the firm's cars but in fact uses his own, the element of necessity seems to be eliminated and the claim would fail. If, on the other hand, a firm's car is not available in present circumstances but one would be made available if J. M. did not have one, there are some grounds for the claim. But in that case one would expect the firm to recognize the existing saving in their own transport service by making J. M. an allowance for using his own car.

Expenses: Domestic Servant; Car Replacements

"Q. Q." asks: (*a*) Is a practitioner entitled to treat as an allowable expense part of the cost of keeping a domestic servant, the servant having to take telephone messages, etc.; and if no servant is available may payment be made to a wife and charged as an expense? (*b*) A car was bought in 1940 for £50 and sold in 1941 for £75. In January, 1946, another car was bought for £294. "Q. Q." intends to buy a new car yearly and will probably expend about £400 on a new car in January, 1947. Can he claim as deductions the differences between what he receives and what he pays on each transaction?

*** (*a*) Yes; but the claim must be reasonable having regard to the proportion of time spent on dealing with professional calls, and the amounts claimed must have been actually paid for the service in question. (*b*) The cost of renewal of a car can be claimed as an expense, but in so far as the payments made relate to improvement rather than to mere replacement they represent capital outlay and are not allowable. In the long run "Q. Q." will probably gain by claiming the initial and depreciation allowances now authorized for 1946–7 and future years.

Sale of Car: "Balancing Charge"

D. O. bought a car in 1939 for £140; wear-and-tear allowances have reduced the written-down value to £25. What will be the position if he now sells the car for £600?

*** (It is assumed that D. O. will continue to practise after the sale of the car.) As the sale will take place after April 5, 1945, D. O. will be liable to a "balancing charge," but the maximum amount will be £140−£25=£115—i.e., the aggregate of the wear-and-tear allowances given in respect of the car.

Employment in 1943-4: Expenses

B. worked as a locumtenent from February, 1943, to January, 1944, in sole charge for an absent owner, and was required to live in the house formerly occupied by the latter. B. started practice on his own account in 1944. Can he claim: (*a*) some cancellation of the 1943–4 tax under the "P.A.Y.E." regulations; (*b*) "salary of wife and maid as allowed to the owner"; and (*c*) cost of running and maintaining car over and above an inadequate allowance?

*** (*a*) As B. apparently was not "employed" after April 5, 1944, he did not in fact come under the "P.A.Y.E." system of tax deduction. He is accordingly not entitled to any cancellation of the tax assessed for 1943–4. (*b*) and (*c*) These expenses can be claimed in so far as it was necessary to incur them to fulfil the

conditions of service—and only if the payments were in fact made. The production of satisfactory evidence in support of the claim may, however, be a matter of some difficulty.

Non-resident Appointment: Travelling Expenses

"FUIMUS" holds a full-time non-resident hospital appointment. He has to attend emergency cases at night and consequently some form of transport is necessary. Can he claim in respect of the cost of keeping a bicycle or car?

*** We fear that the special circumstances would not be regarded as taking the case out of the general rule, which is that the expense of travelling between the residence and the place where the duties of an office are performed are not incurred in carrying out the duties and are therefore inadmissible.

Cash Basis or Earnings Basis

"DEMOBBED" restarted practice at May, 1945. Can he make his return for 1945–6 on the cash receipt basis?

*** No; cash receipts during the early years of restarting a practice will not fully reflect the gross earnings or, consequently, the true profit earned. (It is assumed that tax was not paid by our correspondent on cash coming to hand from his former civil practice after he had ceased civilian work.)

Uniform Allowance: Territorial Army

E. W. was demobilized in 1945 but is on the active list as a major in the R.A.M.C. Territorial Army. Can he claim an allowance for upkeep of uniform, etc.?

*** We understand that in such circumstances an allowance of £7 10s. is made from the pay issued in the course of each financial year.

LETTERS, NOTES, ETC.

Teaching of Surgery in Scotland

Dr. ARTHUR TURNBULL writes from Glasgow: Mr. Aneurin Bevan now states that the national health administration wants "the power to create new teaching hospitals." Does this mean the Ministry seeks a special brand of medical students to carry out the provisions of the Act? If the Minister has not enough doctors to run his show are the conditions of service such as to attract the best men? Army doctors are emigrating to the Colonies in batches. What is the trouble: poor pay or deprivation of freedom? Mr. Lloyd George set up treatment to the patient through the Government, the approved societies, and the doctors, and left the medical colleges to paddle their own canoes. He failed to correlate the training of the surgeon with the application of surgical technique to any one patient. He also failed to provide prompt benefits to the patient, and entirely failed to keep the Act up to date. The Ministry simply mouldered on, and the medical schools were left to provide curricula as best they might. To-day this process is to continue. What is the point in the process—a professor invited to describe surgical methods and technique to a student who is in effect debarred from carrying out an operation on his own patient after graduation?

Unless the Scottish universities move at once and provide a Scottish surgical service, the London Ministry will simply take over the training and so imperil and undermine the quality and status from the Scottish colleges. Replaced by drilled yes-men and routine quacks the Scottish degree will lose its value. Health will be commercialized, and many invaluable lives lost in practice. Therefore the principals of the four Scottish universities should draw up a scheme.

Additional Qualifications of Dentists

In his address from the chair at the opening of the 49th session of the Dental Board Dr. E. W. Fish brought forward a minor problem, that of additional qualifications in the *Dentists Register*. Under the Dentists Act, 1878, it is laid down that medical qualifications granted in the United Kingdom or Ireland which are registrable in the *Medical Register* as primary or additional qualifications in medicine, surgery, or midwifery may be also placed in the *Dentists Register* as additional qualifications, and practitioners who are doubly qualified have been able for more than sixty years to register their medical qualifications as dental qualifications. But with the prospective amendment of the Dentists Acts on other grounds Dr. Fish suggested that some questions might arise as to the extension of additional qualifications which are registrable. At present the General Medical Council must be satisfied that (1) the additional qualification was granted after examination, (2) that the examination was held by one of the universities and corporations which choose members of the G.M.C., and (3) that the qualification was granted in respect of a higher degree of knowledge than is required to obtain a licence in dental surgery or dentistry. To take the first of these requirements, would it be desirable in any amendment of the Acts to perpetuate the present exclusion of honorary degrees from the *Register*? Further, should the "examination" requirement be waived, ought honorary degrees in subjects other than dentistry to be included? As to the second requirement, that the examination must have been held by one of the medical authorities in this kingdom, might not the right now be extended, so far as concerns additional qualifications, to diplomates of bodies of equivalent standing in imperial or even in foreign territories? Then there is the perplexing requirement that the qualification must have been granted in respect of "a higher degree of knowledge." What is a higher degree of knowledge? Is it sufficient to include general medicine and surgery, as has been done since the early 'eighties, or may the knowledge of which it is necessary to take account include the biological and physical sciences or, indeed, any other branch of learning? These seem to be minor matters, but they may have on occasion much importance. At present the whole question of the registration of additional qualifications is the business of the General Medical Council, which is bound by the conditions imposed on it by the Dentists Act of 1878, but it will become the business of the Dental Board or its successor if the unanimous recommendation of both bodies to the Interdepartmental Committee is translated into law, and in that event some re-interpretation of these old rules more in conformity with modern conditions may be expected.

Prevention of Baldness

Dr. E. GALLOP (London, S.W.1) writes: The aetiology of the rarer forms of baldness is not clear, but I do not think this applies wholly to the common form that embraces the great majority of cases—the bald vertex of the adult male. It is too familiar to need description. Yet there are certain points about it, obvious as they are, that deserve notice. It is confined to the crown of the head of the adult man. It does not occur in women or children. The body hair remains unaffected. In what way does the hair of the man's scalp receive treatment different from the rest of his body and from that of his sisters? The answer is so obvious that it attracts no attention. For countless years he has applied various substances to it. Our contemporary young man favours mucilage. His father preferred a scented grease, a brilliantine it was called; his great-grandfather a more frank oil, as his granny's antimacassars, protecting the furniture, indicated. The effect of these and others was the same. They smarmed down the hair, kept it in regulation order, but did not allow the individual hairs to breathe, and in due course they gave up the unequal struggle and fell out. Efforts were sometimes made to restore them. So-called stimulating hair lotions were employed. As well whip a dying horse. An irreversible change was in progress. It is all very curious. There is no intrinsic attractiveness in the well-pomaded head. Rather the reverse, in fact. The explanation, I think, lies far back—very far back, and is connected with the imperfectly understood objects and provenance of the custom of anointing the head for religious purposes. We are dealing, I believe, with a survival of a custom which has lost its functional meaning, but because of a deep innate conservatism, which makes us cling to the maintenance of old forms, remains now only for decorative purposes. One could give other examples of the same thing happening. But baldness is much to pay for the *status quo*, and occasionally unruly hair is better than none at all. To preserve it, perhaps all that is necessary is to refuse to be overrun by the minor tyrannies of fashion and to put *nothing* on it. This includes leaving the hair wet with water to keep it smoothly in place and, of course, it must be before the falling-out process has gone too far. Other factors are probably involved, but I believe that much the most important has been considered.

Treatment at Spas

Dr. G. D. KERSLEY (Bath) writes: Since publication of my letter (June 1, p. 848) it has been pointed out to me that, in addition to the three larger spa hospitals I mentioned in my original letter, there is a 30-bedded hospital for similar treatment at Woodhall Spa. I should like to apologize for this omission.

Varicella Herpetiformis

Dr. H. ANGELL LANE (Abbots Langley) writes: In the very interesting article by Drs. P. H. Peterson and S. A. B. Black (May 18, p. 762) it might be useful—as a prophylactic measure—to examine the blood for the presence of Türk cells. These are found (3 to 9%) in a great majority of cases of chicken-pox from the second until the sixth or eighth day of the rash. I have not found them in any of the cases of herpes that had no relation to chicken-pox.

Corrigendum

Mr. STANLEY WAY (Newcastle-upon-Tyne) writes: In a report of paper on the lower-segment Caesarean section read by me to th North of England Obstetrical and Gynaecological Society (June 1 p. 926) the gross mortality for 500 cases is stated to be 3.4%. Th figure is incorrect. There were seven deaths in the series and th gross mortality rate should therefore be 1.4%.